



TEST REPORT

FOR

AC to DC Power Supply

BRAND : The TRACO POWER logo, featuring the words 'TRACO' and 'POWER' in white capital letters on a dark blue rectangular background.

MODEL : TPP 300-124B-M

SERIES MODEL : Refer to item 5.1 for more details

REPORT NUMBER: 4790133959A-EN-E0-V0

ISSUE DATE: Nov. 9, 2021

Prepared for

TRACO ELECTRONIC AG

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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|------------------|-------------------|
| -- | Nov. 9, 2021 | Initial Issue | Cindy Hsin |

| Summary of Test Results | | | | |
|--------------------------------|---|------------------|--------|----------|
| EMISSION | | | | |
| Standard | Test Item | Limit | Result | Remark |
| EN 55032:2015 / A11: 2020 | Conducted disturbance at mains terminals ports | Class B (Note 3) | PASS | (Note 4) |
| | Conducted common mode (asymmetric mode) disturbance telecommunication ports | Class B | N/A | (Note 1) |
| | Radiated disturbance below 1GHz | Class A (Note 3) | PASS | (Note 4) |
| | Radiated disturbance above 1 GHz | Class B | N/A | (Note 2) |
| EN IEC 61000-3-2 : 2019 | Harmonic current disturbance | Class A | PASS | (Note 4) |
| EN 61000-3-3 : 2013 / A1: 2019 | Voltage Fluctuations & Flicker | Refer to 6.5.1 | PASS | (Note 4) |

Note 1: Since the EUT does not contain asymmetric port, the test is unnecessary.

Note 2: Since the highest frequency of EUT is less than 108 MHz, the measurement above 1 GHz is unnecessary.

Note 3: The test performed of laboratory was according to the client requirements

Note 4: All test data are copied from 4789837839A-EN-E0-V0 report.

| Summary of Test Results (EN 55024) | | | | |
|---|---|---|------------------------------|------------------|
| IMMUNITY | | | | |
| Basic Standard | Test Item | Class / Severity | Require Performance Criteria | Result |
| IEC 61000-4-2: 2008 EN 61000-4-2: 2009 | Electrostatic discharge immunity | Contact ±4 kV Air ±8 kV | B | PASS (Note 6) |
| IEC 61000-4-3: 2006+ A1: 2007+A2: 2010 EN 61000-4-3: 2006+ A1: 2008+A2: 2010 | Radiated, radio frequency electromagnetic field immunity | 3V/m 80%, 1kHz, AM | A | PASS (Note 6) |
| IEC 61000-4-4: 2012 EN 61000-4-4: 2012 | Electrical fast transient/burst immunity | 1kV(AC Mains) 5/50ns, 5kHz | B | PASS (Note 6) |
| | | 0.5kV(DC port) 5/50ns, 5kHz | B | N/A (Note 4) |
| | | 0.5kV(Signal Lines) 5/50ns, 5kHz or 100kHz (Note 3) | B | N/A (Note 5) |
| IEC 61000-4-5: 2014 / A1: 2017 EN 61000-4-5: 2014 / A1: 2017 | Surge immunity | AC Mains 2.0kV(Common) 1.0kV(Differential) 1.2/50us | B | PASS (Note 6) |
| | | DC power port 0.5kV Line to ground 1.2/50us | B | N/A (Note 4) |
| | | Signal port 1.0kV(w/o primary protector) 4.0kV(w primary protector) 1.2/50us or 10/700us (Note 1) | C | N/A (Note 5) |
| IEC 61000-4-6: 2013+ COR1: 2015 EN 61000-4-6: 2014 /AC:2015 | Immunity to conducted disturbances, induced by radio-frequency fields | AC Mains 3V (e.m.f), 80%, 1kHz Amp. Mod. (Note 2) | A | PASS (Note 6) |
| | | DC power port 3V (e.m.f), 80%, 1kHz Amp. Mod (Note 2) | A | N/A (Note 4) |
| | | Signal line 3V (e.m.f), 80%, 1kHz Amp. Mod. (Note 2) | A | N/A (Note 5) |
| IEC 61000-4-8: 2009 EN 61000-4-8: 2010 | Power frequency magnetic field immunity (Continuous) | 50 Hz, 1 A/m(r.m.s) | A | PASS (Note 6) |

| Summary of Test Results (EN 55024) | | | | |
|---|---|---|------------------------------|------------------|
| IMMUNITY | | | | |
| Basic Standard | Test Item | Class / Severity | Require Performance Criteria | Result |
| IEC 61000-4-11: 2020 EN IEC 61000-4-11: 2020 | Voltage dips, short interruptions and voltage variations immunity | Voltage dips, >95% reduction with 0.5 period | B | PASS (Note 6) |
| | | Voltage dips, 30% reduction with 25 periods | C | |
| | | Voltage interruptions >95% reduction with 250 periods | C | |

Note 1: Where the coupling network for the 10/700 μ s waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μ s waveform and appropriate coupling network.

Note 2: The frequency range is scanned as specified. However, when specified in EN 55024 Annex A, an additional comprehensive functional test shall be carried out at a limited number of frequencies. The selected frequencies for conducted tests are: 0,2; 1; 7,1; 13,56; 21; 27,12 and 40,68 MHz (± 1 %).

Note 3: For xDSL equipment, the repetition frequency for EFT testing shall be 100 kHz .

Note 4: Since the EUT does not contain DC power port, the test is unnecessary.

Note 5: Since the EUT does not contain signal port, the test is unnecessary.

Note 6: All test data are copied from 4789837839A-EN-E0-V0 report.

| Summary of Test Results (EN 55035) | | | | |
|---|--|---|------------------------------|------------------|
| IMMUNITY | | | | |
| Basic Standard | Test Item | Class / Severity | Require Performance Criteria | Result |
| IEC 61000-4-2: 2008 EN 61000-4-2: 2009 | Electrostatic discharge immunity | Contact ±4 kV Air ±8 kV | B | PASS (Note 6) |
| IEC 61000-4-3: 2006+ A1: 2007+A2: 2010 EN 61000-4-3: 2006+ A1: 2008+A2: 2010 | Continuous RF electromagnetic field disturbances, swept test | 80-1000MHz 3V/m 80%, 1kHz, AM | A | PASS (Note 6) |
| | Continuous RF electromagnetic field disturbances, spot test | 1800 ;2600 ;3500 5000 MHz (±1%) 3V/m 80%, 1kHz, AM (Note 2) | A | PASS (Note 6) |
| | immunity levels to common wireless communication devices | Refer to Table I.1 | A | PASS (Note 6) |
| IEC 61000-4-4: 2012 EN 61000-4-4: 2012 | Electrical fast transient/burst immunity | 1kV(AC Mains) 5/50ns, 5kHz | B | PASS (Note 6) |
| | | 0.5kV(DC power port) 5/50ns, 5kHz | B | N/A (Note 4) |
| | | 0.5kV(Signal Lines) 5/50ns, 5kHz or 100kHz (Note 3) | B | N/A (Note 5) |
| IEC 61000-4-5: 2014 + A1: 2017 EN 61000-4-5: 2014 | Surge immunity | AC Mains 2.0kV(Common) 1.0kV(Differential) 1.2/50us | B | PASS (Note 6) |
| | | DC power port 0.5kV Line to ground 1.2/50us | B | N/A (Note 4) |
| | | Signal port 1.0kV (w/o primary protector) 4.0kV (w primary protector) 1.2/50us or 10/700us 0.5kV Coaxial or shielded to ground 1.2/50 (8/20) us (Note 1) | C | N/A (Note 5) |

| Summary of Test Results (EN 55035) | | | | |
|--|---|---|------------------------------|------------------|
| IMMUNITY | | | | |
| Basic Standard | Test Item | Class / Severity | Require Performance Criteria | Result |
| IEC 61000-4-6: 2013+ COR1: 2015 EN 61000-4-6: 2014 /AC:2015 | Continuous induced RF disturbances | AC Mains 0.15~10MHz, 3V 10~30MHz, 3~1V 30-80MHz, 1V with 1kHz 80% AM (Note 2) | A | PASS (Note 6) |
| | | DC Ports 0.15~10MHz, 3V 10~30MHz, 3~1V 30-80MHz, 1V with 1kHz 80% AM (Note 2) | A | N/A (Note 4) |
| | | Signal Line 0.15~10MHz, 3V 10~30MHz, 3~1V 30-80MHz, 1V with 1kHz 80% AM (Note 2) | A | N/A (Note 5) |
| IEC 61000-4-8: 2009 EN 61000-4-8: 2010 | Power frequency magnetic field immunity (Continuous) | 50 Hz, 1 A/m(r.m.s) | A | PASS (Note 6) |
| IEC 61000-4-11: 2020 EN IEC 61000-4-11: 2020 | Voltage dips, short interruptions and voltage variations immunity | Voltage dips, <5% residual with 0.5cycles | B | PASS (Note 6) |
| | | Voltage dips, 70% residual with 25 cycles | C | |
| | | Voltage interruptions, <5% residual with 250 cycles | C | |

Note 1: Where the coupling network for the 10/700 μ s waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μ s waveform and appropriate coupling network.

Note 2: The frequency range is scanned as specified. However, when specified in EN 55035 , an additional EUT contains telephony functional test shall be carried out at a limited number of frequencies. The selected frequencies for conducted immunity tests are: 0,2; 1; 7,1; 13,56; 21; 27,12 and 40,68 MHz (± 1 %) and radiated immunity tests are 80; 120; 160; 230; 434; 460; 600; 863 and 900MHz (± 1 %).

Note 3: For xDSL equipment, the repetition frequency for EFT testing shall be 100 kHz .

Note 4: Since the EUT does not contain DC power port, the test is unnecessary.

Note 5: Since the EUT does not contain signal port, the test is unnecessary.

Note 6: All test data are copied from 4789837839A-EN-E0-V0 report.

Table I.1 – Guidance on the selection of immunity levels to common wireless communication devices

| Table clause | Approximate protection distance (m) | Calculated RF field strength in V/m for frequencies and protection distances simulating different radio transmission types, assuming a given ERP | | | | | | |
|--------------|-------------------------------------|--|---------|---------|--------------------|----------------|-------------|--|
| | | LTE/UMTS (0,2 W) | GSM | | WiMAX/3 G (1,26 W) | WiMAX (1,26 W) | Wi-Fi (1 W) | Maximum RF field strength at any frequency |
| | | | (2 W) | (1 W) | | | | |
| | | 800 MHz | 900 MHz | 1,8 GHz | 2,6 GHz | 3,5 GHz | 5 GHz | |
| I.1.1 | 3,0 | 0,6 | 1,8 | 1,3 | 1,5 | 1,5 | 1,3 | 3 |
| I.1.2 | 1,5 | 1,2 | 3,7 | 2,6 | 2,9 | 2,9 | 2,6 | 4 |
| I.1.3 | 1,0 | 1,7 | 5,5 | 3,9 | 4,4 | 4,4 | 3,9 | 6 |
| I.1.4 | 0,5 | 3,3 | 10,5 | 10,5 | 11,8 | 11,8 | 10,5 | 12 |
| I.1.5 | 0,2 | 8,3 | 26,4 | 26,4 | 29,6 | 29,6 | 26,4 | 30 |

The protection distance is not the test distance as defined in IEC 61000-4-3:2006/AMD1:2007/AMD2:2010, but the shortest expected operating distance between the EUT and the interfering wireless communication device at which the immunity performance criteria will be satisfied.

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TRACO ELECTRONIC AG
Sihlbruggstrasse 111 CH-6340 Baar Switzerland

MANUFACTURER: TRACO ELECTRONIC AG
Sihlbruggstrasse 111 CH-6340 Baar Switzerland

EUT DESCRIPTION: AC to DC Power Supply

BRAND :



MODEL: TPP 300-124B-M

SERIES MODEL: Refer to item 5.1 for more details

DATE of TESTED: Feb. 25, 2021 ~ Jul. 7, 2021

| APPLICABLE STANDARDS | |
|--|--------------|
| STANDARDS | TEST RESULTS |
| EN 55032 :2015 / A11: 2020 EN 55024: 2010+A1: 2015 EN 55035: 2017 / A1 :2020 EN IEC 61000-3-2: 2019 EN 61000-3-3 : 2013 / A1: 2019 | PASS |

Underwriters Laboratories Taiwan Co., Ltd. Tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. Based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. And all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. Will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Cindy Hsin
Project Handler

Date : Nov. 9, 2021

Approved and Authorized By:

Roy Chen
Operations Manager

Date : Nov. 9, 2021

2. TEST METHODOLOGY

All tests were performed in accordance with the procedures documented EN 55032, EN 55024, EN55035, EN IEC 61000-3-2 and EN 61000-3-3.

3. FACILITIES AND ACCREDITATION

| | |
|---------------|---|
| Test Location | Underwriters Laboratories Taiwan Co., Ltd., |
| Address | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan |
| Description | All measurement facilities use to collect the measurement data are located at Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan |

4. CALIBRATION AND UNCERTAINTY

4.1. Measuring Instrument Calibration

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Electromagnetic interference:

| Test Item | Measurement Frequency Range | K | U(dB) |
|--|-----------------------------|---|-------|
| Conducted disturbance at mains terminals ports | 0.15MHz ~ 30MHz | 2 | 3.1 |
| 966-1 Test Site | | | |
| Radiated disturbance below 1 GHz | 30MHz ~ 1000MHz | 2 | 5.3 |

| Test Item | K | Voltage(%) | Current(%) |
|------------------|---|------------|------------|
| Harmonic&Flicker | 2 | 0.17 | 0.39 |

Electromagnetic sensitivity:

| Test Item | Measurement Frequency Range | K | U(dB) |
|---|-----------------------------|---|-------|
| Radiated, radio frequency electromagnetic field immunity | 80MHz ~ 6000MHz | 2 | 1.8 |
| Immunity to conducted disturbances, induced by radio-frequency fields (CDN) | 0.15MHz ~ 80MHz | 2 | 2.4 |

| Test Item | K | Voltage(%) | Rise Time(%) | First Peak Current (%) | Current @ 30ns (%) | Current @ 60ns (%) |
|----------------------------------|---|------------|--------------|------------------------|--------------------|--------------------|
| Electrostatic discharge immunity | 2 | 2.8 | 7.1 | 4.2 | 4.0 | 4.5 |

| Test Item | K | Peak Voltage(%) | Rise Time(%) | Pulse width(%) | Burst Period (%) | Burst duration (%) | Repetition rate (%) |
|--|---|-----------------|--------------|----------------|------------------|--------------------|---------------------|
| Electrical fast transient/burst immunity | 2 | 1.1 | 1.5 | 1.7 | 0.94 | 0.41 | 0.29 |

| Test Item | K | Phase Shifting (%) | Voltage (%) | Current (%) | Front Time (For waveform of the surge voltage)(%) | Duration (For waveform of the surge voltage)(%) | Front Time (For waveform of the surge current)(%) | Duration (For waveform of the surge current)(%) |
|----------------|---|--------------------|-------------|-------------|---|---|---|---|
| Surge immunity | 2 | 0.98 | 3.6 | 2.7 | 1.2 | 0.43 | 5.9 | 0.79 |

| Test Item | K | Magnetic field Strength(%) |
|--|---|----------------------------|
| Power Frequency Magnetic Field Immunity Test | 2 | 10.0 |

| Test Item | K | Voltage(%) | Time (%) | Phase Angle (%) |
|---|---|------------|----------|-----------------|
| Voltage dips, short interruptions and voltage variations immunity | 2 | 2.2 | 3.1 | 1.1 |

5. EQUIPMENT UNDER TEST

5.1. Description of EUT

| | |
|--------------------------------------|---|
| EUT Name: | AC to DC Power Supply |
| Brand: |  |
| Model: | TPP 300-124B-M |
| Series Model: | TPP 300-112XY-Z, TPP 300-115XY-Z, TPP 300-118XY-Z, TPP 300-124XY-Z, TPP 300-128XY-Z, TPP 300-136XY-Z, TPP 300-148XY-Z, TPP 300-153XY-Z, TPI 300-112XY-Z, TPI 300-115XY-Z, TPI 300-118XY-Z, TPI 300-124XY-Z, TPI 300-128XY-Z, TPI 300-136XY-Z, TPI 300-148XY-Z, TPI 300-153XY-Z |
| Power Rating: | From AC power |
| Highest Frequency within EUT: | Less than 108MHz |
| Condition of EUT: | Pre-Production |
| Date Of Receipt Of Sample: | Feb. 24, 2021 |

Note :

1. This report was issued base on original report which report number is 4789837839A-EN-E0-V0, the differences were only change models' name and the applicant. There is no additional test shall be verified. For the test data, copied from original report 4789837839A-EN-E0-V0 show on this report.
2. The models difference table as below:

| Model Number | Input Voltage Range (Vac) | Output Voltage (Vdc) |
|-----------------|---------------------------|----------------------|
| TPP 300-112XY-Z | 85 ~ 264 | 12 |
| TPP 300-115XY-Z | 85 ~ 264 | 15 |
| TPP 300-118XY-Z | 85 ~ 264 | 18 |
| TPP 300-124XY-Z | 85 ~ 264 | 24 |
| TPP 300-128XY-Z | 85 ~ 264 | 28 |
| TPP 300-136XY-Z | 85 ~ 264 | 36 |
| TPP 300-148XY-Z | 85 ~ 264 | 48 |
| TPP 300-153XY-Z | 85 ~ 264 | 53 |
| TPI 300-112XY-Z | 85 ~ 264 | 12 |
| TPI 300-115XY-Z | 85 ~ 264 | 15 |
| TPI 300-118XY-Z | 85 ~ 264 | 18 |
| TPI 300-124XY-Z | 85 ~ 264 | 24 |
| TPI 300-128XY-Z | 85 ~ 264 | 28 |
| TPI 300-136XY-Z | 85 ~ 264 | 36 |
| TPI 300-148XY-Z | 85 ~ 264 | 48 |
| TPI 300-153XY-Z | 85 ~ 264 | 53 |

"X" can be blank or B
 When X = blank represents no provision for protective earthing
 When X = B represents protective earthing

"Y" can be blank, DR, L, A
 when Y = blank represent Enclosed type
 when Y = DR represent Din rail type
 when Y = L represent Base plate type
 when Y = A represents Open type

"Z" can be -M, blank or -J
 when Z = -M represents Molex connector
 when Z = blank represents terminal block
 when Z = -J represents JST connector

Note : The customer only provided TPP 300-124L-M, TPP 300-124B-M for the EMI pretest and choose the worst mode do the EMI and EMS final test.

5.2. Test Mode

The Pre-test modes :

| Mode | Description | Conducted Emission | Radiated Emission |
|--------|----------------------------|--------------------|-------------------|
| Mode 1 | Full Load (TPP 300-124L-M) | v | v |
| Mode 2 | Full Load (TPP 300-124B-M) | v | v |

After pre-testing, the final test mode was displayed as below table.

| Test Items | | Test Mode |
|-----------------|---|-----------|
| Emission | Conducted Emission | Mode 2 |
| | Radiated Emission | Mode 2 |
| | Harmonic & Flicker | Mode 2 |
| Immunity | Electrostatic Discharge | Mode 1~2 |
| | Radio Frequency Electromagnetic Field | Mode 2 |
| | Electrical Fast Transient | Mode 2 |
| | Surge Immunity | Mode 2 |
| | Immunity to conducted disturbances, induced by radio-frequency fields | Mode 2 |
| | Power frequency magnetic field immunity | Mode 2 |
| | Voltage Dips and Interruptions | Mode 2 |

Note : The customer requires mode 1 in the "ESD" test item. Simulate the test when the open type product is installed in the system, using the base plate as the system chassis.

5.3. EUT Operation Test Setup

For Emission test :

- a. The EUT was linked to resistance load with full load during the testing.
- b. Power on the EUT and run test.

For Immunity test :

- a. The EUT was linked to resistance load with full load and the resistance load was connected with a meter during the testing.
- b. Power on the EUT and run test.

5.4. Monitoring of EUT for All Immunity Test

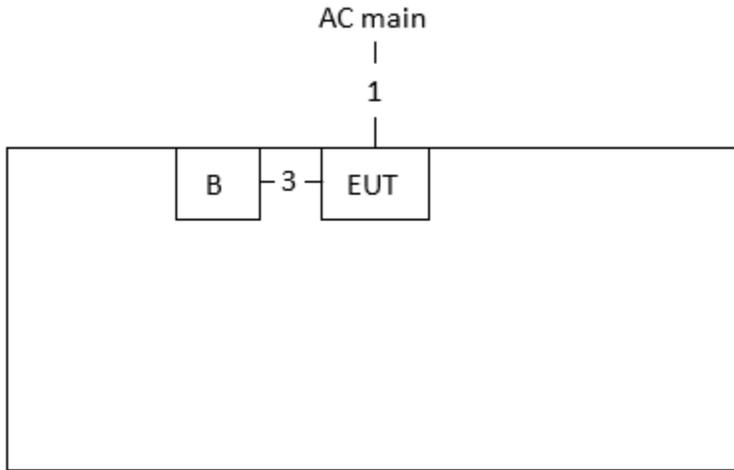
| | |
|---------------|---|
| Audio | N/A |
| Visual | Monitor the output voltage through the meter. |

5.5. Accessory

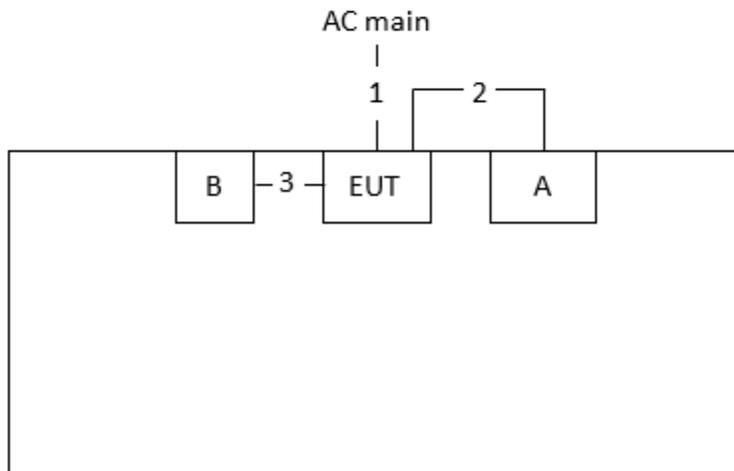
N/A

5.6. Block diagram showing the configuration of system tested

For Emission test :



For Immunity test :



5.7. Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | FCC ID | Note |
|------|-----------|-----------|----------------|------------|--------|------|
| A | Meter | CNSCKJ | C85C1-V | N/A | N/A | N/A |
| B | Load | N/A | N/A | N/A | N/A | N/A |

| Item | Connection | Shielded Type | Note |
|------|----------------|---------------|---------------------|
| 1 | AC power cable | Non-shielded | Provide by customer |
| 2 | Power Wire*2 | Non-shielded | N/A |
| 3 | Power wire *2 | Non-shielded | Provide by customer |

5.8. Measuring Instrument List

| Instrument | | | | | |
|---|---------------------------|--|------------------------|------------|--------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Expired date |
| Conducted Disturbance | | | | | |
| EMI Test Receiver | Rohde & Schwarz | ESR7 | 101753 | 2020/11/17 | 2021/11/16 |
| Two-Line V-Network | Rohde & Schwarz | ENV216 | 102136 | 2020/8/19 | 2021/8/18 |
| Two-Path V-LISN | SCHWARZBECK | NSLK 8127 | 8127-946 | 2020/11/3 | 2021/11/2 |
| RF Current Probe | FCC | F-52 | 171502 | 2021/1/19 | 2022/1/18 |
| Coupling and Decoupling Network | TESEQ | ISN ST08 | 45105 | 2021/1/19 | 2022/1/18 |
| Impedance Stabilization Network | TESEQ | ISN T800 | 42830 | 2021/3/2 | 2022/3/1 |
| Impedance Stabilization Network | TESEQ | ISN T8-Cat6 | 39923 | 2021/1/27 | 2022/1/26 |
| Capacitive Voltage Probe | TESEQ | CVP 2200A | 44922 | 2021/1/31 | 2022/1/30 |
| Impuls-Begrenzer Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 102219-Qt | 2020/8/12 | 2021/8/11 |
| Cable | TITAN | CFD200 | T0732ACFD20020A300-1 | 2021/3/2 | 2022/3/1 |
| Measurement Software | Farad | EZ-EMC Ver: UL-3A1.2 | N/A | N/A | N/A |
| Radiated Disturbance | | | | | |
| 966-1 | | | | | |
| EMI Test Receiver | Rohde & Schwarz | ESR7 | 101755 | 2020/12/4 | 2021/12/3 |
| Trilog-Broadband Antena with 5dB Attenuator | SCHWARZBECK | VULB 9168 & N-6-05 | 774 & AT-N0538 | 2021/1/13 | 2022/1/12 |
| Double Ridged Guide Horn Antenna | SCHWARZBECK | BBHA 9120 D | 1686 | 2020/12/23 | 2021/12/22 |
| Preamplifier | EMC Instrument | EMC330E | 980404 | 2020/6/4 | 2021/6/3 |
| Preamplifier | EMC Instrument | EMC051835BE | 980407 | 2021/1/20 | 2022/1/19 |
| Cables | UltraPhase&EMC Instrument | A1K50-UP0358-A1K50-1500&EMC106-NM-SM-2500/8000 | 170111-3&170104/170223 | 2021/2/3 | 2022/2/2 |
| Measurement Software | Farad | EZ-EMC Ver: UL-3A1 | N/A | N/A | N/A |
| Voltage Harmonic & Flicker | | | | | |
| single phase coupling unit | TESEQ | CCN1000-1 | 1652A01270 | 2020/4/15 | 2021/4/14 |
| Programmable AC and DC Power Sources | TESEQ | NSG1007 | 1652A00760 | 2020/4/15 | 2021/4/14 |
| Measurement Software | TESEQ | WIN2100(4.14.0) | N/A | N/A | N/A |

| Instrument | | | | | |
|---|-----------------------|---------------------------|---------------|------------|--------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Expired date |
| Electrostatic discharge | | | | | |
| ESD Generator | TESEQ | NSG 437 | 1125 | 2020/12/3 | 2021/12/2 |
| Barometer | TFA | DIVA PLUS | 35.1078.10.IT | 2021/6/4 | 2022/6/3 |
| Radio frequency electromagnetic field immunity | | | | | |
| RF and Microwave Signal Generator | Rohde & Schwarz | SMB100A | 113793 | 2021/2/20 | 2022/2/19 |
| Power amplifier | Milmega | 80RF1000-300 | 1077558 | N/A | N/A |
| Power amplifier | Milmega | AS0860B | 1077559 | N/A | N/A |
| Directional coupler | Werlatone | C10117-10 | 111786 | N/A | N/A |
| Directional coupler | Werlatone | C8719-20 | 111759 | N/A | N/A |
| Antenna | AR | ATR80M6G | 346008 | N/A | N/A |
| Antenna | SCHWARZBECK | STLP 9149 | 00441 | N/A | N/A |
| RF switch | OSP | OSP | N/A | N/A | N/A |
| Power Meter | Rohde & Schwarz | NRP2 | 105524 | 2020/9/16 | 2021/9/15 |
| Power Sensor | Rohde & Schwarz | NRP-Z91 | 103732 | 2020/9/16 | 2021/9/15 |
| Power Sensor | Rohde & Schwarz | NRP-Z91 | 103733 | 2020/9/16 | 2021/9/15 |
| Sound Calibrator | Bruel&Kjaer | Type 4231 | 3016784 | 2020/2/14 | 2023/2/12 |
| Audio Analyzer | Rohde & Schwarz | UPV | 104227 | 2020/11/23 | 2021/11/22 |
| Pressure-field 1/2" Microphone | Bruel&Kjaer | Type 4192 | 3069928 | 2020/3/13 | 2023/3/12 |
| Mouth Simulator | Bruel&Kjaer | Type 4227 | 3078961 | 2020/3/6 | 2023/3/5 |
| GPS signal generator | Keysight Technologies | N5172B | MY56200315 | 2021/1/15 | 2022/1/14 |
| Radio Communication Analyzer | Rohde & Schwarz | CMW500 | 161254 | 2020/12/13 | 2021/12/12 |
| Measurement Software | Rohde & Schwarz | EMC32, VER.10.20.01 | N/A | N/A | N/A |
| Electrical fast transient | | | | | |
| Ultra Compact Simulator | EM TEST | UCS 500N7 | P1628180275 | 2020/12/2 | 2021/12/1 |
| Capacitive Coupling Clamp | EM TEST | HFK | P1642185790 | 2020/11/19 | 2021/11/18 |
| Measurement Software | TESEQ | IEC.control, VER.7.1.5 | N/A | N/A | N/A |

| Instrument | | | | | |
|--|-----------------|-------------------------------|--------------------------------|------------|--------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Expired date |
| Surge | | | | | |
| Ultra Compact Simulator | EM TEST | UCS 500N7 | P1628180275 | 2020/12/2 | 2021/12/1 |
| Telecom Surge Generator | EM TEST | TSurge7 | P1620180015 | 2020/12/4 | 2021/12/3 |
| Coupling and Decoupling Network | EM TEST | CNV 508T5 | P1637184038 | 2020/12/7 | 2021/12/6 |
| Coupling and Decoupling Network | TESEQ | CDN HSS-2 | 45091 | 2020/12/7 | 2021/12/6 |
| Measurement Software | TESEQ | IEC.control, VER.7.1.5 | N/A | N/A | N/A |
| Immunity to conducted disturbances, induced by radio-frequency fields | | | | | |
| Signal Generator | Rohde & Schwarz | SMC100A | 105811 | 2020/10/6 | 2021/10/5 |
| Power amplifier | Rohde & Schwarz | BBA150-A125B125 | 102340 | N/A | N/A |
| Coupling and Decoupling Network | TESEQ | CDN M016 | 45073 | 2021/3/19 | 2022/3/18 |
| Coupling and Decoupling Network | TESEQ | CDN T2-10 | 45003 | 2021/3/19 | 2022/3/18 |
| Coupling and Decoupling Network | TESEQ | CDN T4-10 | 44939 | 2021/3/19 | 2022/3/18 |
| Coupling and Decoupling Network | TESEQ | CDN T8-10 | 49203 | 2020/12/14 | 2021/12/13 |
| EM Injection Clamp | TESEQ | CAL 801A & KEMZ 801A | 75454.1, 75454.2 & 45181 | 2021/3/23 | 2022/3/22 |
| Current Injection Probe | TESEQ | CIP 9136A | 44618 | 2020/10/25 | 2021/10/24 |
| Power - Sensor | Rohde & Schwarz | NRP-Z91 | 103730 | 2020/12/9 | 2021/12/8 |
| Power - Sensor | Rohde & Schwarz | NRP-Z91 | 103731 | 2020/12/9 | 2021/12/8 |
| Sound Calibrator | Bruel&Kjaer | Type 4231 | 3016784 | 2020/2/14 | 2023/2/12 |
| Audio Analyzer | Rohde & Schwarz | UPV | 104227 | 2020/11/23 | 2021/11/22 |
| Radio Communication Analyzer | Rohde & Schwarz | CMW500 | 161254 | 2020/12/13 | 2021/12/12 |
| Pressure-field 1/2" Microphone | Bruel&Kjaer | Type 4192 | 3069928 | 2020/3/13 | 2023/3/12 |
| Mouth Simulator | Bruel&Kjaer | Type 4227 | 3078961 | 2020/3/6 | 2023/3/5 |
| Measurement Software | Rohde & Schwarz | EMC32, VER.10.20.01 | N/A | N/A | N/A |
| Power frequency magnetic field immunity | | | | | |
| Ultra Compact Simulator | EM TEST | UCS 500N7 | P1628180275 | 2020/12/2 | 2021/12/1 |
| Current Transformer | EM TEST | MC 2630 | P1644186773 | 2020/9/4 | 2021/9/3 |
| Magnetic Field Test Antena | EM TEST | MS 100N | P1627181324 | 2020/9/4 | 2021/9/3 |
| Current Transformer | EM TEST | MFT100 | P2025241594 | 2020/9/4 | 2021/9/3 |
| Motorized Variac | EM TEST | MV 2616 (varic NX1-260-16) | P1643186426 | 2020/12/2 | 2021/12/1 |

| Instrument | | | | | |
|---------------------------------------|---------------------|-------------------------------|-------------------|------------------|---------------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Expired date |
| Voltage dips and interruptions | | | | | |
| Ultra Compact Simulator | EM TEST | UCS 500N7 | P1628180275 | 2020/12/2 | 2021/12/1 |
| Motorized Variac | EM TEST | MV 2616 (varic NX1-260-16) | P1643186426 | 2020/12/2 | 2021/12/1 |
| Measurement Software | TESEQ | IEC.control, VER.7.1.5 | N/A | N/A | N/A |

6. EMISSION TEST

6.1. Conducted Disturbance Measurement

6.1.1. Limits of conducted disturbance voltage and common mode disturbance.

AC mains port:

| FREQUENCY (MHz) | <input type="checkbox"/> Class A (dB μ V) | | <input checked="" type="checkbox"/> Class B (dB μ V) | |
|-----------------|---|---------|--|----------|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46* |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

Telecommunications/network port:

| FREQUENCY (MHz) | <input type="checkbox"/> Class A | | | |
|-----------------|----------------------------------|----------|---------------------------|----------|
| | Voltage limit (dB μ V) | | Current limit(dB μ A) | |
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 97 - 87 * | 84 - 74* | 53 - 43 * | 40 - 30* |
| 0.50 -30.0 | 87.00 | 74.00 | 43.00 | 30.00 |
| FREQUENCY (MHz) | <input type="checkbox"/> Class B | | | |
| | Voltage limit (dB μ V) | | Current limit(dB μ A) | |
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 84 - 74 * | 74 - 64* | 40 - 30 * | 30 - 20* |
| 0.50 -30.0 | 74.00 | 64.00 | 30.00 | 20.00 |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value - Limit Value

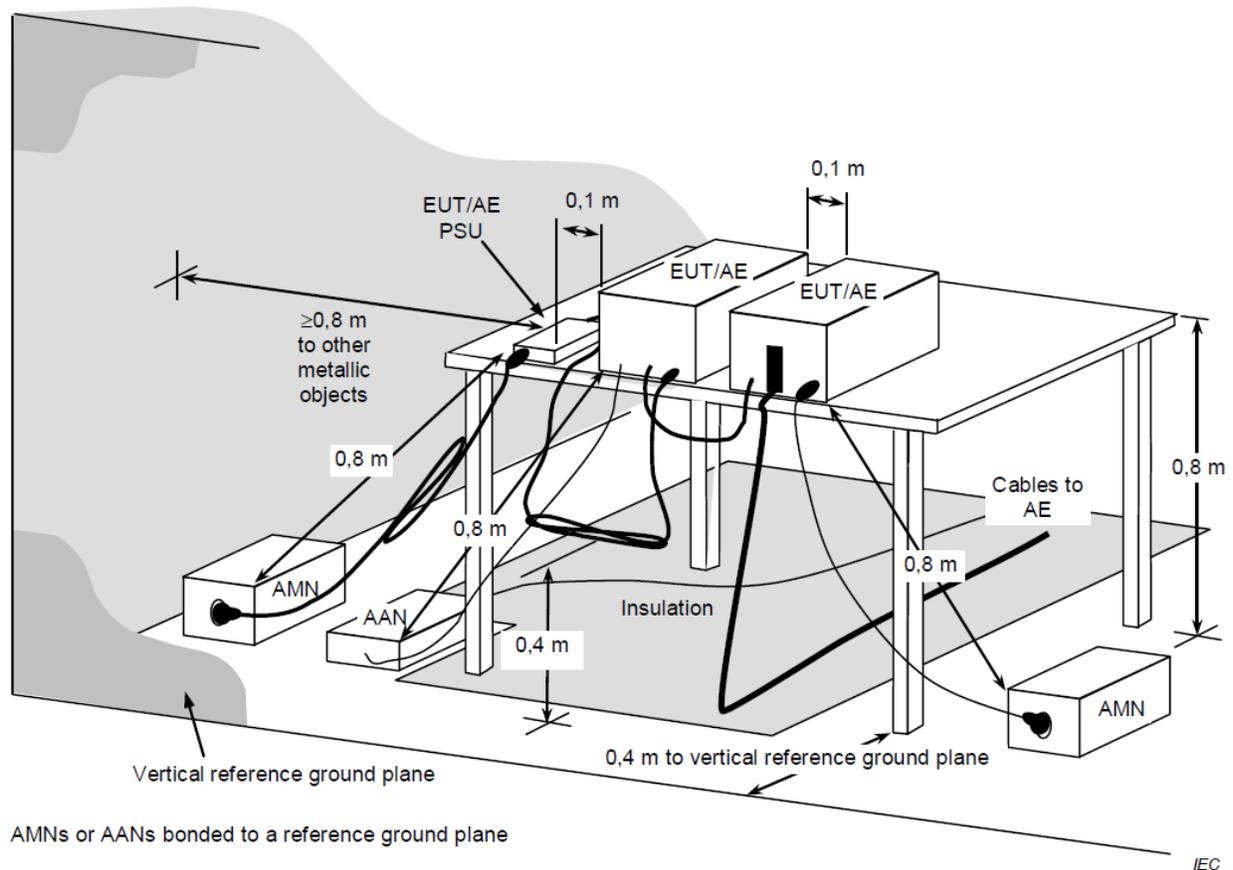
The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---------------------|----------|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

6.1.2. Test Procedure

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall at least 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item:EUT Test Photos.

6.1.3. Test Setup

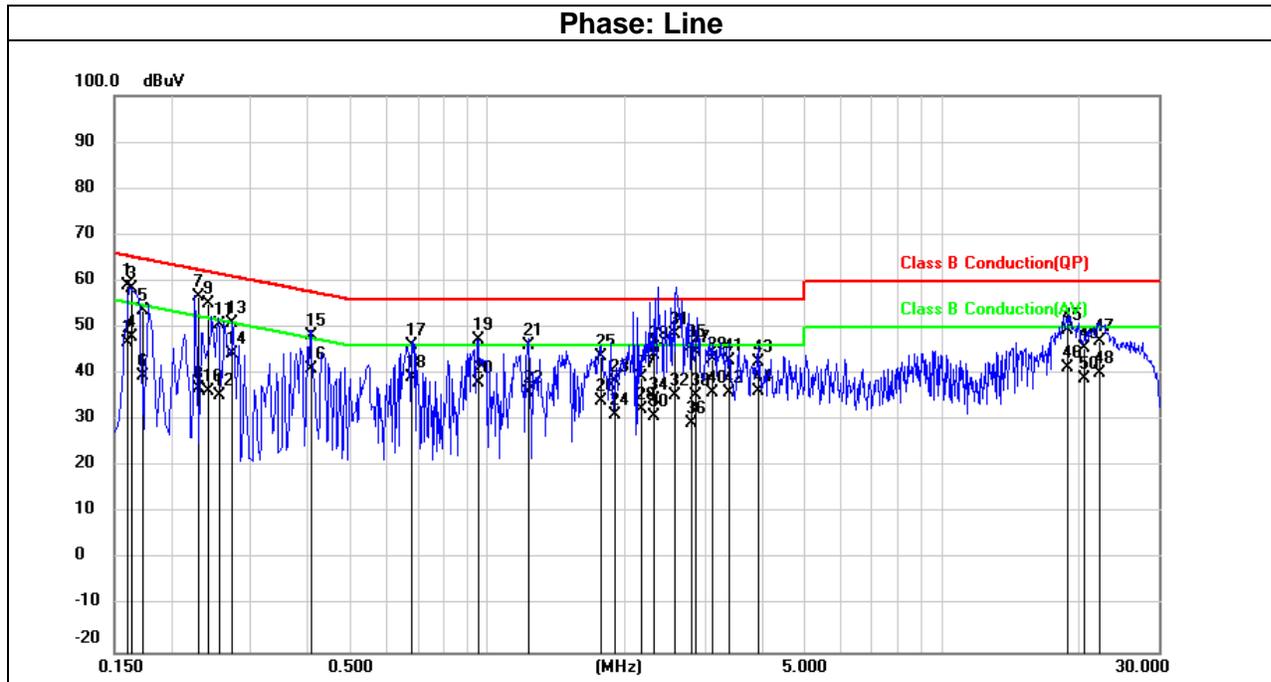


The 0,8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be $\geq 0,8$ m.

For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

6.1.4. Test Result

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 23°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 53%RH |
| Tested By: | Eric T. Fan | Test Date: | Mar. 14, 2021 |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------|---------------|--------------|-------------|--------|
| 1 | 0.1604 | 39.67 | 19.50 | 59.17 | 65.44 | -6.27 | QP |
| 2 | 0.1604 | 27.39 | 19.50 | 46.89 | 55.44 | -8.55 | AVG |
| 3 | 0.1638 | 38.96 | 19.50 | 58.46 | 65.27 | -6.81 | QP |
| 4 | 0.1638 | 28.37 | 19.50 | 47.87 | 55.27 | -7.40 | AVG |
| 5 | 0.1734 | 34.08 | 19.50 | 53.58 | 64.80 | -11.22 | QP |
| 6 | 0.1734 | 20.16 | 19.50 | 39.66 | 54.80 | -15.14 | AVG |
| 7 | 0.2302 | 37.17 | 19.49 | 56.66 | 62.44 | -5.78 | QP |
| 8 | 0.2302 | 17.49 | 19.49 | 36.98 | 52.44 | -15.46 | AVG |
| 9 | 0.2411 | 35.66 | 19.49 | 55.15 | 62.06 | -6.91 | QP |
| 10 | 0.2411 | 16.83 | 19.49 | 36.32 | 52.06 | -15.74 | AVG |
| 11 | 0.2573 | 31.04 | 19.49 | 50.53 | 61.52 | -10.99 | QP |
| 12 | 0.2573 | 15.85 | 19.49 | 35.34 | 51.52 | -16.18 | AVG |
| 13 | 0.2709 | 31.42 | 19.49 | 50.91 | 61.09 | -10.18 | QP |
| 14 | 0.2709 | 24.86 | 19.49 | 44.35 | 51.09 | -6.74 | AVG |
| 15 | 0.4082 | 28.67 | 19.48 | 48.15 | 57.68 | -9.53 | QP |
| 16 | 0.4082 | 21.66 | 19.48 | 41.14 | 47.68 | -6.54 | AVG |
| 17 | 0.6803 | 26.72 | 19.49 | 46.21 | 56.00 | -9.79 | QP |
| 18 | 0.6803 | 19.81 | 19.49 | 39.30 | 46.00 | -6.70 | AVG |
| 19 | 0.9513 | 27.80 | 19.51 | 47.31 | 56.00 | -8.69 | QP |
| 20 | 0.9513 | 18.42 | 19.51 | 37.93 | 46.00 | -8.07 | AVG |
| 21 | 1.2236 | 26.73 | 19.51 | 46.24 | 56.00 | -9.76 | QP |
| 22 | 1.2236 | 16.54 | 19.51 | 36.05 | 46.00 | -9.95 | AVG |
| 23 | 1.9024 | 18.86 | 19.53 | 38.39 | 56.00 | -17.61 | QP |

| | | | | | | | |
|----|---------|-------|-------|-------|-------|--------|-----|
| 24 | 1.9024 | 11.77 | 19.53 | 31.30 | 46.00 | -14.70 | AVG |
| 25 | 1.7663 | 24.08 | 19.53 | 43.61 | 56.00 | -12.39 | QP |
| 26 | 1.7663 | 14.53 | 19.53 | 34.06 | 46.00 | -11.94 | AVG |
| 27 | 2.1731 | 19.83 | 19.53 | 39.36 | 56.00 | -16.64 | QP |
| 28 | 2.1731 | 12.72 | 19.53 | 32.25 | 46.00 | -13.75 | AVG |
| 29 | 2.3217 | 26.10 | 19.54 | 45.64 | 56.00 | -10.36 | QP |
| 30 | 2.3217 | 11.35 | 19.54 | 30.89 | 46.00 | -15.11 | AVG |
| 31 | 2.5815 | 29.12 | 19.54 | 48.66 | 56.00 | -7.34 | QP |
| 32 | 2.5815 | 15.81 | 19.54 | 35.35 | 46.00 | -10.65 | AVG |
| 33 | 2.3098 | 24.57 | 19.54 | 44.11 | 56.00 | -11.89 | QP |
| 34 | 2.3098 | 15.06 | 19.54 | 34.60 | 46.00 | -11.40 | AVG |
| 35 | 2.7862 | 26.41 | 19.54 | 45.95 | 56.00 | -10.05 | QP |
| 36 | 2.7862 | 9.90 | 19.54 | 29.44 | 46.00 | -16.56 | AVG |
| 37 | 2.8532 | 25.15 | 19.54 | 44.69 | 56.00 | -11.31 | QP |
| 38 | 2.8532 | 15.89 | 19.54 | 35.43 | 46.00 | -10.57 | AVG |
| 39 | 3.1247 | 23.62 | 19.56 | 43.18 | 56.00 | -12.82 | QP |
| 40 | 3.1247 | 16.53 | 19.56 | 36.09 | 46.00 | -9.91 | AVG |
| 41 | 3.3965 | 23.15 | 19.56 | 42.71 | 56.00 | -13.29 | QP |
| 42 | 3.3965 | 16.44 | 19.56 | 36.00 | 46.00 | -10.00 | AVG |
| 43 | 3.9397 | 23.00 | 19.58 | 42.58 | 56.00 | -13.42 | QP |
| 44 | 3.9397 | 16.72 | 19.58 | 36.30 | 46.00 | -9.70 | AVG |
| 45 | 19.0081 | 29.65 | 19.75 | 49.40 | 60.00 | -10.60 | QP |
| 46 | 19.0081 | 21.68 | 19.75 | 41.43 | 50.00 | -8.57 | AVG |
| 47 | 22.2720 | 27.32 | 19.75 | 47.07 | 60.00 | -12.93 | QP |
| 48 | 22.2720 | 20.34 | 19.75 | 40.09 | 50.00 | -9.91 | AVG |
| 49 | 20.6457 | 25.66 | 19.75 | 45.41 | 60.00 | -14.59 | QP |
| 50 | 20.6457 | 19.27 | 19.75 | 39.02 | 50.00 | -10.98 | AVG |

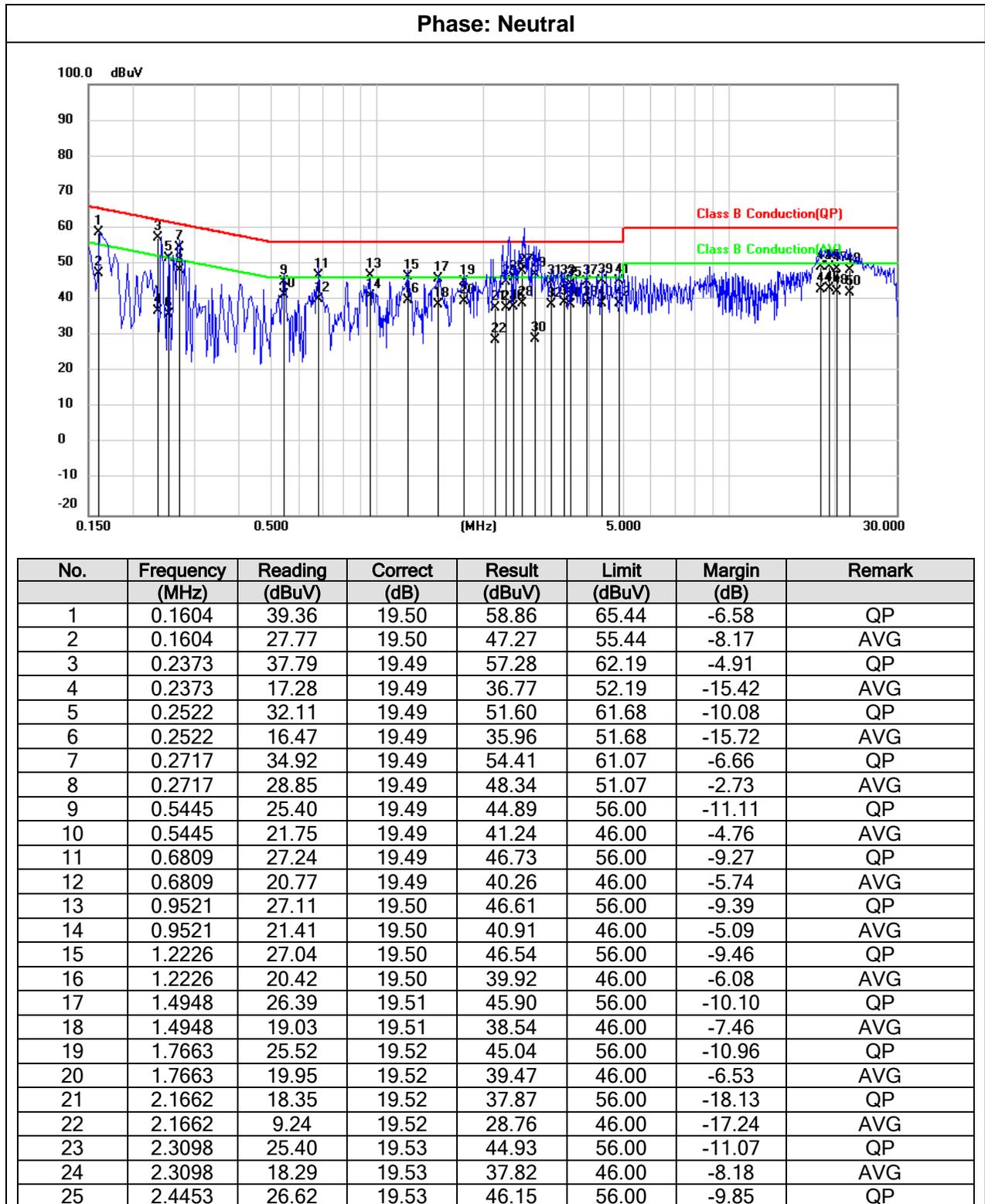
Remark:

Result = Reading +Correct

Correct = Insertion Loss + Cable Loss + Attenuator factor

Margin = Result – Limit

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 23°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 53%RH |
| Tested By: | Eric T. Fan | Test Date: | Mar. 14, 2021 |



| | | | | | | | |
|----|---------|-------|-------|-------|-------|--------|-----|
| 26 | 2.4453 | 18.59 | 19.53 | 38.12 | 46.00 | -7.88 | AVG |
| 27 | 2.5808 | 28.44 | 19.54 | 47.98 | 56.00 | -8.02 | QP |
| 28 | 2.5808 | 19.50 | 19.54 | 39.04 | 46.00 | -6.96 | AVG |
| 29 | 2.8064 | 27.42 | 19.54 | 46.96 | 56.00 | -9.04 | QP |
| 30 | 2.8064 | 9.37 | 19.54 | 28.91 | 46.00 | -17.09 | AVG |
| 31 | 3.1247 | 25.41 | 19.55 | 44.96 | 56.00 | -11.04 | QP |
| 32 | 3.1247 | 18.97 | 19.55 | 38.52 | 46.00 | -7.48 | AVG |
| 33 | 3.3960 | 25.37 | 19.55 | 44.92 | 56.00 | -11.08 | QP |
| 34 | 3.3960 | 19.65 | 19.55 | 39.20 | 46.00 | -6.80 | AVG |
| 35 | 3.5320 | 24.80 | 19.57 | 44.37 | 56.00 | -11.63 | QP |
| 36 | 3.5320 | 19.18 | 19.57 | 38.75 | 46.00 | -7.25 | AVG |
| 37 | 3.9394 | 25.24 | 19.58 | 44.82 | 56.00 | -11.18 | QP |
| 38 | 3.9394 | 19.29 | 19.58 | 38.87 | 46.00 | -7.13 | AVG |
| 39 | 4.3465 | 25.55 | 19.58 | 45.13 | 56.00 | -10.87 | QP |
| 40 | 4.3465 | 19.39 | 19.58 | 38.97 | 46.00 | -7.03 | AVG |
| 41 | 4.8897 | 25.65 | 19.60 | 45.25 | 56.00 | -10.75 | QP |
| 42 | 4.8897 | 19.26 | 19.60 | 38.86 | 46.00 | -7.14 | AVG |
| 43 | 18.3295 | 29.38 | 19.81 | 49.19 | 60.00 | -10.81 | QP |
| 44 | 18.3295 | 23.00 | 19.81 | 42.81 | 50.00 | -7.19 | AVG |
| 45 | 19.4155 | 29.47 | 19.83 | 49.30 | 60.00 | -10.70 | QP |
| 46 | 19.4155 | 23.22 | 19.83 | 43.05 | 50.00 | -6.95 | AVG |
| 47 | 20.3733 | 28.70 | 19.83 | 48.53 | 60.00 | -11.47 | QP |
| 48 | 20.3733 | 22.34 | 19.83 | 42.17 | 50.00 | -7.83 | AVG |
| 49 | 22.0024 | 28.43 | 19.84 | 48.27 | 60.00 | -11.73 | QP |
| 50 | 22.0024 | 22.01 | 19.84 | 41.85 | 50.00 | -8.15 | AVG |

Remark:
 Result = Reading +Correct
 Correct = Insertion Loss + Cable Loss + Attenuator factor
 Margin = Result – Limit

6.2. Radiated Disturbance Measurement(below 1GHz)

6.2.1. Limits of radiated disturbance measurement

| FREQUENCY (MHz) | <input checked="" type="checkbox"/> Class A | | <input type="checkbox"/> Class B | |
|-----------------|---|---|----------------------------------|--------------------------------|
| | <input type="checkbox"/> At 10m | <input checked="" type="checkbox"/> At 3m | <input type="checkbox"/> At 10m | <input type="checkbox"/> At 3m |
| | dB μ V/m | dB μ V/m | dB μ V/m | dB μ V/m |
| 30 – 230 | 40 | 50 | 30 | 40 |
| 230 – 1000 | 47 | 57 | 37 | 47 |

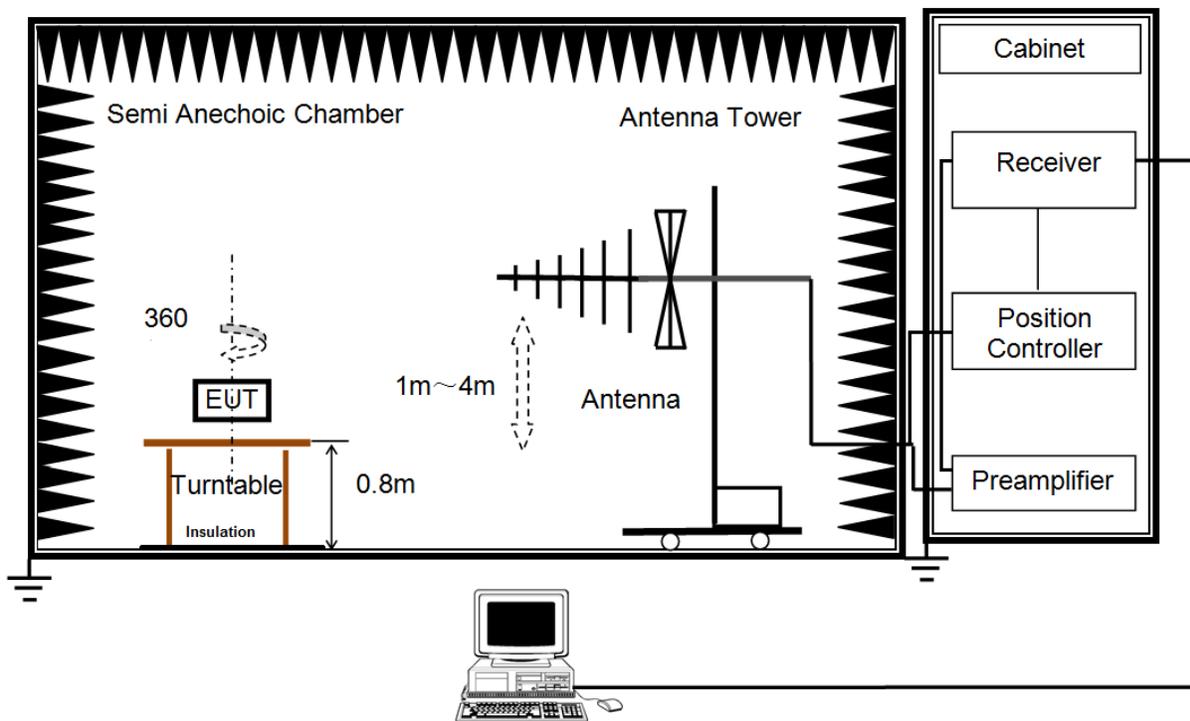
NOTE:

- (1) The limit for radiated test was performed according to EN55032.
- (2) The tighter limit applies at the band edges.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor,
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use),
 Margin Level = Measurement Value - Limit Value.

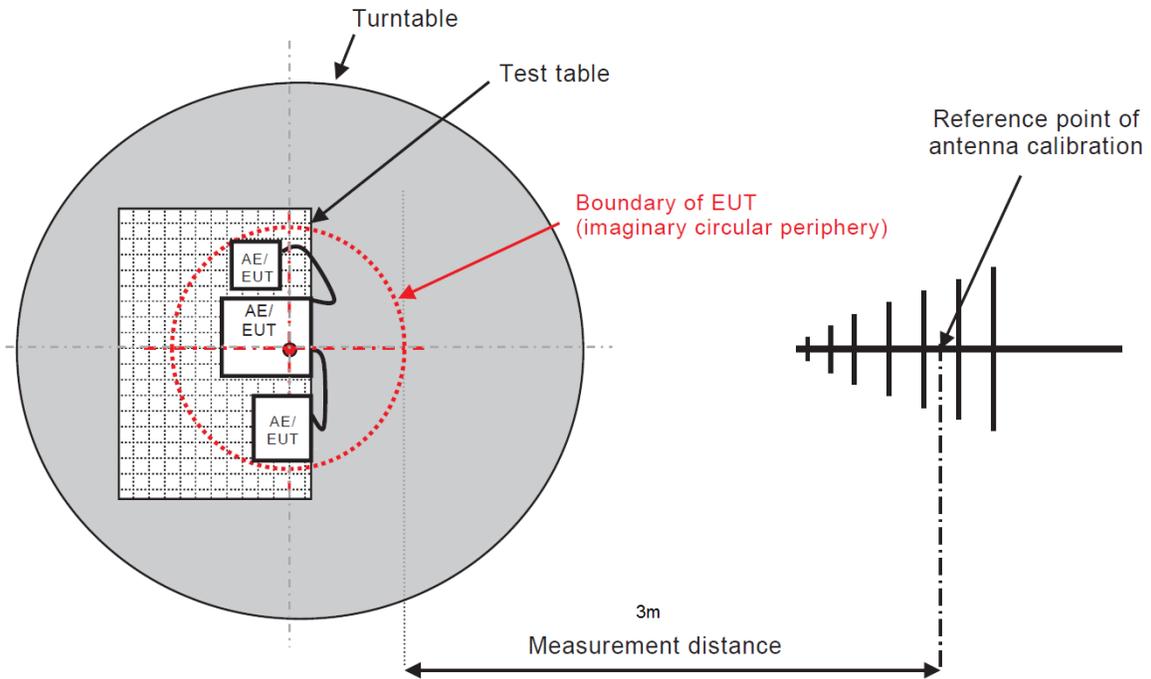
6.2.2. Test Procedure

- a. The measuring distance of at 3m shall be used for measurements at frequency from 30 to 1000MHz.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment shall be set at 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item:EUT Test Photos.

6.2.3. Test Setup

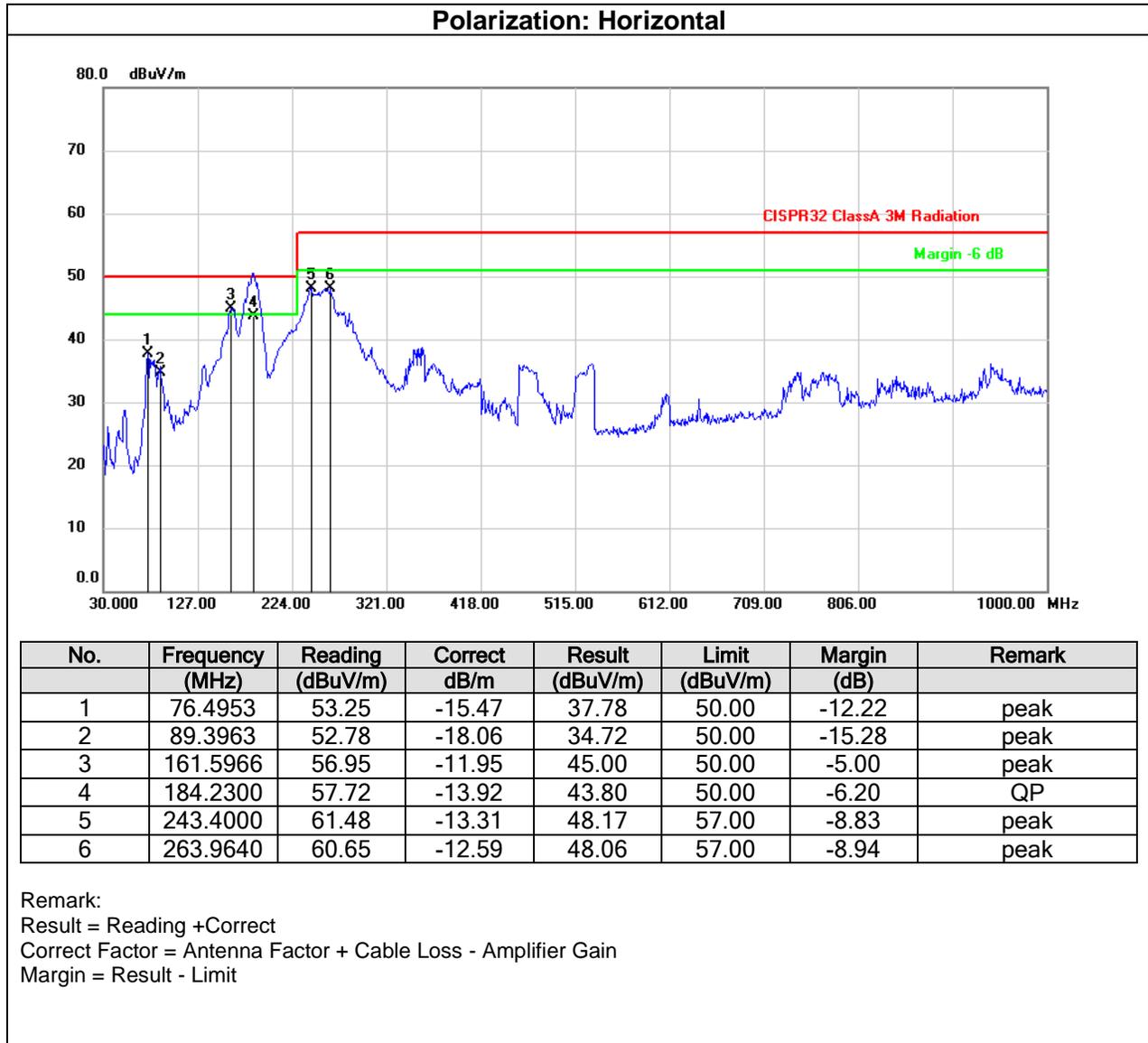


For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

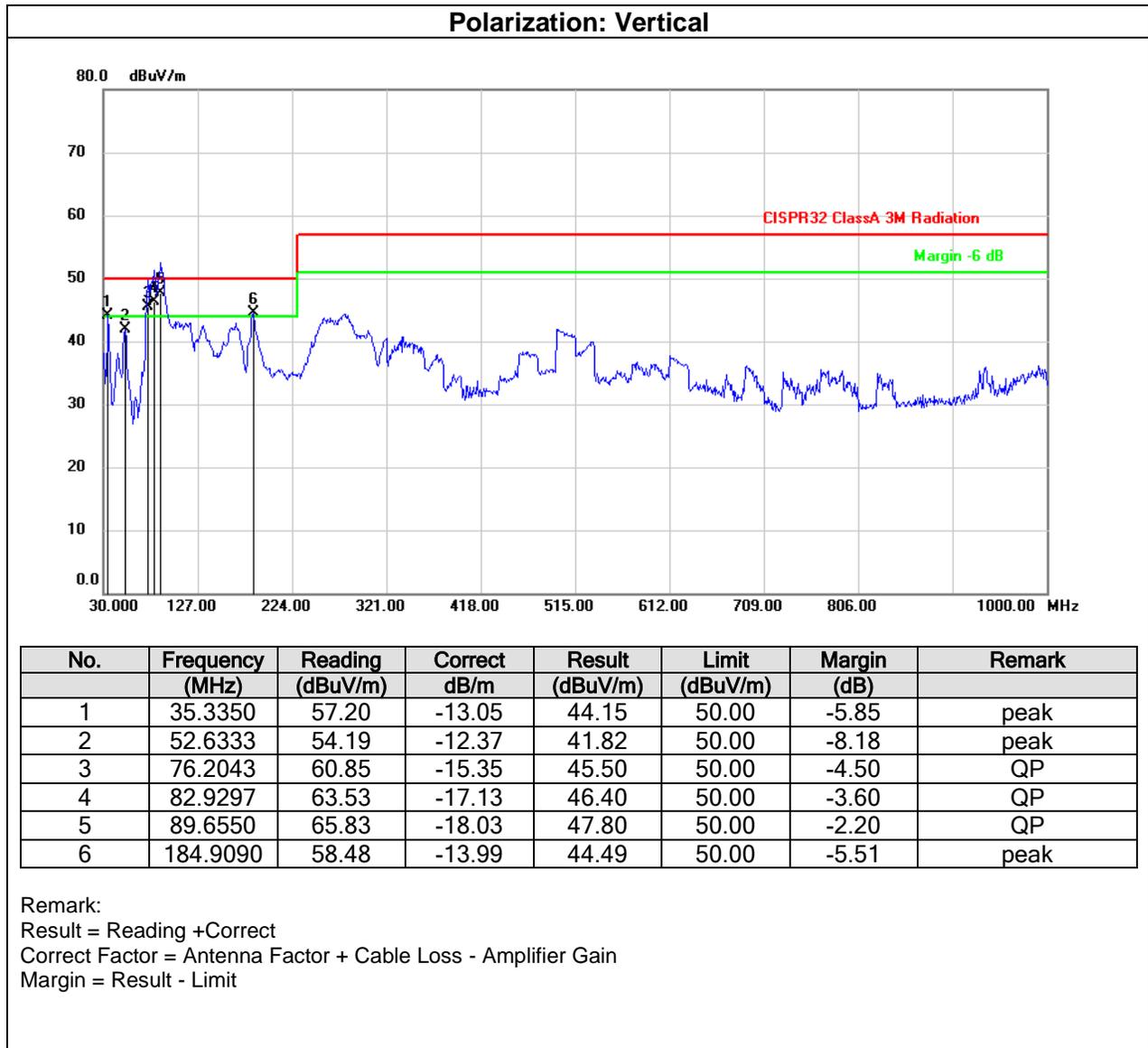


6.2.4. Test Result

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 25°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 59%RH |
| Tested By: | Eric T. Fan | Test Date: | Feb. 25, 2021 |



| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 25°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 59%RH |
| Tested By: | Eric T. Fan | Test Date: | Feb. 25, 2021 |



6.3. Harmonic Current Disturbance Measurement

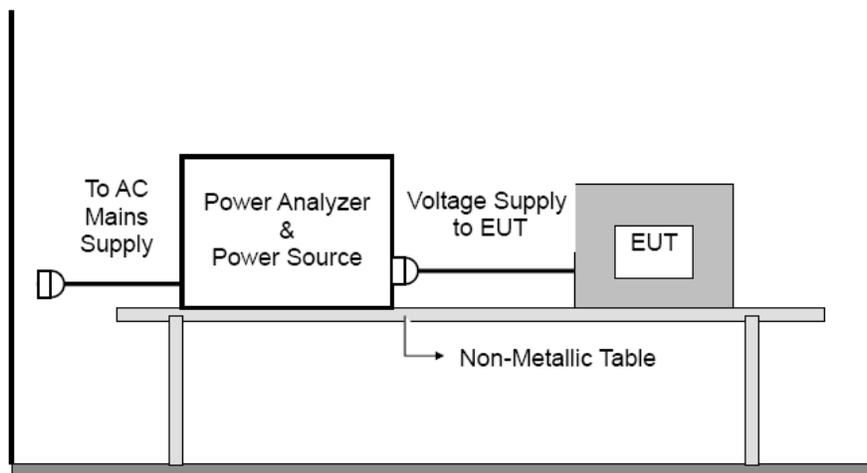
6.3.1. Limits of Harmonic Current

| EN 61000-3-2/ IEC 61000-3-2 | | | | | | |
|-----------------------------|---------------------|--|--------------------|---------------------|---|--------|
| Equipment Category | Harmonic Order n | Max. Permissible Harmonic Current A | Equipment Category | Harmonic Order n | Max. Permissible Harmonic Current A mA/w | |
| Class A | Odd Harmonics | | Class D | Odd Harmonics only | | |
| | 3 | 2.30 | | 3 | 2.30 | 3.4 |
| | 5 | 1.14 | | 5 | 1.14 | 1.9 |
| | 7 | 0.77 | | 7 | 0.77 | 1.0 |
| | 9 | 0.40 | | 9 | 0.40 | 0.5 |
| | 11 | 0.33 | | 11 | 0.33 | 0.35 |
| | 13 | 0.21 | | 13 | 0.21 | 0.296 |
| | 15 ≤ n ≤ 39 | 0.15 x 15/n | | 15 ≤ n ≤ 39 | 0.15 x 15/n | 3.85/n |
| | Even Harmonics | | | | | |
| | 2 | 1.08 | | | | |
| | 4 | 0.43 | | | | |
| | 6 | 0.30 | | | | |
| | 8 ≤ n ≤ 40 | 0.23 x 8/n | | | | |

6.3.2. Test Procedure

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce under normal conditions
- b. Tests was performed according to the Test the measured values of the harmonics components of the input current in Clause 7 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

6.3.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

6.3.4. Test Condition

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 62%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 9, 2021 |

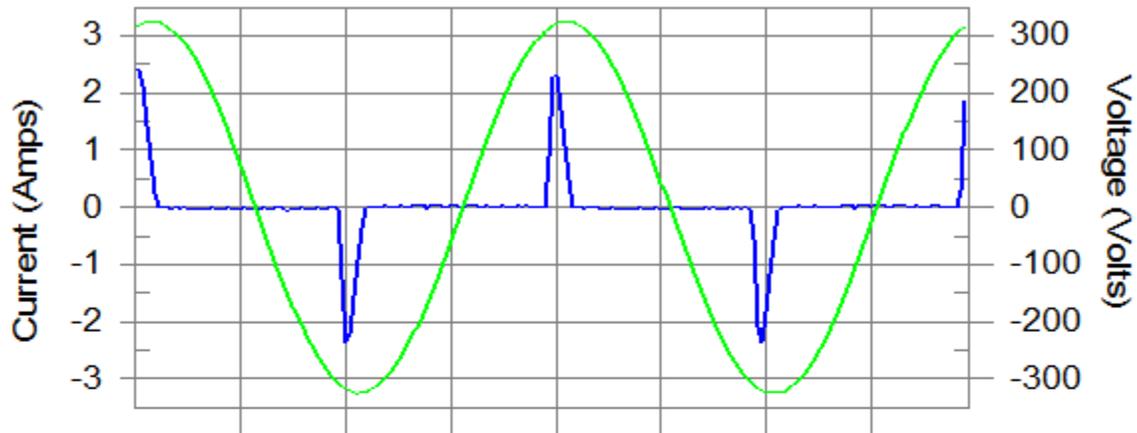
6.3.5. Test Result

Mode 2 :

Harmonics – Class-A per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

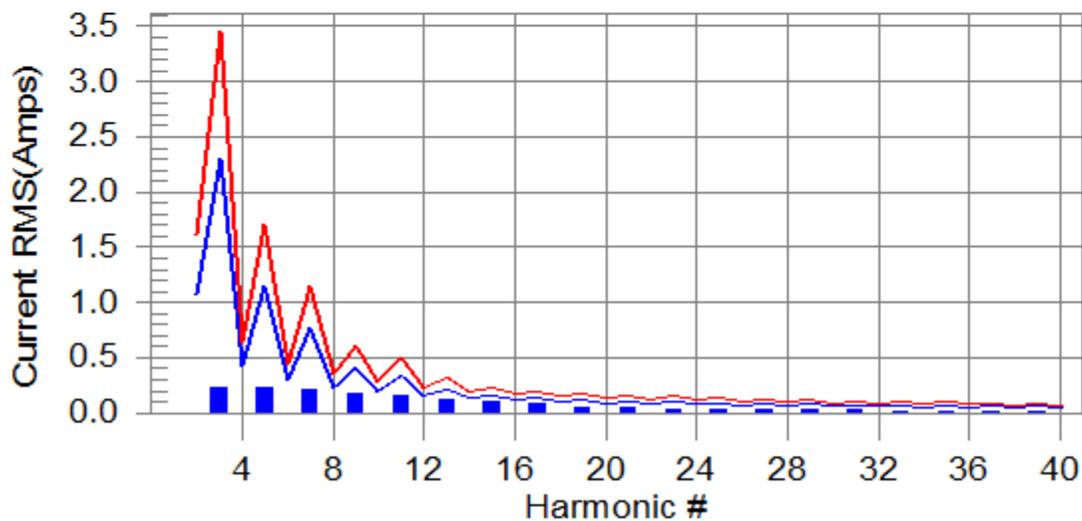
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-46.4% of 150% limit, H15-66.7% of 100% limit

Current Test Result Summary (Run time)

Test Result: Pass Source qualification: Normal
 THC(A): 0.493 I-THD(%): 197.2 POHC(A): 0.085 POHC Limit(A): 0.251

Highest parameter values during test:

| | |
|-----------------------|----------------------|
| V RMS (Volts): 229.95 | Frequency(Hz): 50.00 |
| I Peak (Amps): 2.474 | I RMS (Amps): 0.552 |
| I Fund (Amps): 0.250 | Crest Factor: 4.484 |
| Power (Watts): 56.1 | Power Factor: 0.453 |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|-------|------------|-----------|-----------|------------|-----------|-----------|--------|
| 2 | 0.001 | 1.080 | N/A | 0.001 | 1.620 | N/A | Pass |
| 3 | 0.235 | 2.300 | 10.2 | 0.239 | 3.450 | 6.9 | Pass |
| 4 | 0.001 | 0.430 | N/A | 0.001 | 0.645 | N/A | Pass |
| 5 | 0.221 | 1.140 | 19.4 | 0.224 | 1.710 | 13.1 | Pass |
| 6 | 0.001 | 0.300 | N/A | 0.001 | 0.450 | N/A | Pass |
| 7 | 0.202 | 0.770 | 26.3 | 0.203 | 1.155 | 17.6 | Pass |
| 8 | 0.001 | 0.230 | N/A | 0.001 | 0.345 | N/A | Pass |
| 9 | 0.179 | 0.400 | 44.8 | 0.180 | 0.600 | 30.0 | Pass |
| 10 | 0.001 | 0.184 | N/A | 0.001 | 0.276 | N/A | Pass |
| 11 | 0.153 | 0.330 | 46.4 | 0.156 | 0.495 | 31.4 | Pass |
| 12 | 0.001 | 0.153 | N/A | 0.002 | 0.230 | N/A | Pass |
| 13 | 0.126 | 0.210 | 60.1 | 0.130 | 0.315 | 41.2 | Pass |
| 14 | 0.003 | 0.131 | N/A | 0.003 | 0.197 | N/A | Pass |
| 15 | 0.100 | 0.150 | 66.7 | 0.104 | 0.225 | 46.4 | Pass |
| 16 | 0.001 | 0.115 | N/A | 0.001 | 0.173 | N/A | Pass |
| 17 | 0.077 | 0.132 | 58.0 | 0.081 | 0.198 | 41.0 | Pass |
| 18 | 0.001 | 0.102 | N/A | 0.001 | 0.153 | N/A | Pass |
| 19 | 0.057 | 0.118 | 48.2 | 0.062 | 0.178 | 34.7 | Pass |
| 20 | 0.001 | 0.092 | N/A | 0.001 | 0.138 | N/A | Pass |
| 21 | 0.043 | 0.107 | 40.4 | 0.047 | 0.161 | 29.2 | Pass |
| 22 | 0.003 | 0.084 | N/A | 0.003 | 0.125 | N/A | Pass |
| 23 | 0.035 | 0.098 | 36.2 | 0.038 | 0.147 | 25.7 | Pass |
| 24 | 0.001 | 0.077 | N/A | 0.002 | 0.115 | N/A | Pass |
| 25 | 0.032 | 0.090 | 35.5 | 0.033 | 0.135 | 24.4 | Pass |
| 26 | 0.001 | 0.071 | N/A | 0.001 | 0.107 | N/A | Pass |
| 27 | 0.030 | 0.083 | 36.2 | 0.031 | 0.125 | 24.7 | Pass |
| 28 | 0.002 | 0.066 | N/A | 0.002 | 0.099 | N/A | Pass |
| 29 | 0.028 | 0.078 | 36.1 | 0.029 | 0.116 | 24.7 | Pass |
| 30 | 0.001 | 0.061 | N/A | 0.001 | 0.092 | N/A | Pass |
| 31 | 0.025 | 0.073 | 34.1 | 0.026 | 0.109 | 23.7 | Pass |
| 32 | 0.002 | 0.058 | N/A | 0.002 | 0.086 | N/A | Pass |
| 33 | 0.020 | 0.068 | 29.9 | 0.022 | 0.102 | 21.3 | Pass |
| 34 | 0.001 | 0.054 | N/A | 0.001 | 0.081 | N/A | Pass |
| 35 | 0.016 | 0.064 | 24.3 | 0.017 | 0.096 | 17.7 | Pass |
| 36 | 0.001 | 0.051 | N/A | 0.001 | 0.077 | N/A | Pass |
| 37 | 0.011 | 0.061 | 18.3 | 0.012 | 0.091 | 13.6 | Pass |
| 38 | 0.001 | 0.048 | N/A | 0.001 | 0.073 | N/A | Pass |
| 39 | 0.008 | 0.058 | 14.0 | 0.009 | 0.087 | 10.1 | Pass |
| 40 | 0.000 | 0.046 | N/A | 0.001 | 0.069 | N/A | Pass |

Voltage Source Verification Data (Run time)

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

| | | | |
|---------------------------|--------|--------------------------|-------|
| Voltage (Vrms): | 229.95 | Frequency(Hz): | 50.00 |
| I _{Peak} (Amps): | 2.474 | I _{RMS} (Amps): | 0.552 |
| I _{Fund} (Amps): | 0.250 | Crest Factor: | 4.484 |
| Power (Watts): | 56.1 | Power Factor: | 0.453 |

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|-------|-----------------|-------------|------------|--------|
| 2 | 0.034 | 0.460 | 7.48 | OK |
| 3 | 0.378 | 2.069 | 18.27 | OK |
| 4 | 0.015 | 0.460 | 3.33 | OK |
| 5 | 0.052 | 0.920 | 5.67 | OK |
| 6 | 0.011 | 0.460 | 2.42 | OK |
| 7 | 0.050 | 0.690 | 7.32 | OK |
| 8 | 0.012 | 0.460 | 2.56 | OK |
| 9 | 0.063 | 0.460 | 13.75 | OK |
| 10 | 0.009 | 0.460 | 1.87 | OK |
| 11 | 0.071 | 0.230 | 30.79 | OK |
| 12 | 0.013 | 0.230 | 5.67 | OK |
| 13 | 0.059 | 0.230 | 25.76 | OK |
| 14 | 0.006 | 0.230 | 2.53 | OK |
| 15 | 0.060 | 0.230 | 26.02 | OK |
| 16 | 0.006 | 0.230 | 2.55 | OK |
| 17 | 0.053 | 0.230 | 22.93 | OK |
| 18 | 0.011 | 0.230 | 4.60 | OK |
| 19 | 0.043 | 0.230 | 18.53 | OK |
| 20 | 0.011 | 0.230 | 4.96 | OK |
| 21 | 0.035 | 0.230 | 15.30 | OK |
| 22 | 0.004 | 0.230 | 1.70 | OK |
| 23 | 0.031 | 0.230 | 13.69 | OK |
| 24 | 0.003 | 0.230 | 1.12 | OK |
| 25 | 0.030 | 0.230 | 13.20 | OK |
| 26 | 0.002 | 0.230 | 0.76 | OK |
| 27 | 0.035 | 0.230 | 15.20 | OK |
| 28 | 0.002 | 0.230 | 0.86 | OK |
| 29 | 0.032 | 0.230 | 13.75 | OK |
| 30 | 0.004 | 0.230 | 1.74 | OK |
| 31 | 0.031 | 0.230 | 13.45 | OK |
| 32 | 0.002 | 0.230 | 0.88 | OK |
| 33 | 0.028 | 0.230 | 12.24 | OK |
| 34 | 0.002 | 0.230 | 0.82 | OK |
| 35 | 0.025 | 0.230 | 10.75 | OK |
| 36 | 0.002 | 0.230 | 0.97 | OK |
| 37 | 0.020 | 0.230 | 8.81 | OK |
| 38 | 0.001 | 0.230 | 0.64 | OK |
| 39 | 0.016 | 0.230 | 6.78 | OK |
| 40 | 0.006 | 0.230 | 2.64 | OK |

6.4. Voltage Fluctuation and Flick Measurement

6.4.1. Limits of Voltage Fluctuation and Flick

| Test items | Limits | Descriptions |
|------------|---|--|
| P_{st} | $\leq 1.0, T_p=10\text{min}$ | short-term flicker indicator |
| P_{lt} | $\leq 0.65, T_p=2\text{h}$ | long-term flicker indicator |
| d_c | $\leq 3.3\%$ | relative steady-state voltage change |
| d_{max} | $\leq 4\%$ (or 6% ^{Note(1)} , 7% ^{Note(2)}) | maximum relative voltage change: |
| $d_{(t)}$ | $\leq 3.3\%$, more than 500ms | relative voltage change characteristic |

Note:

(1)6 % for equipment which is:

- a. switched manually, or
- b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

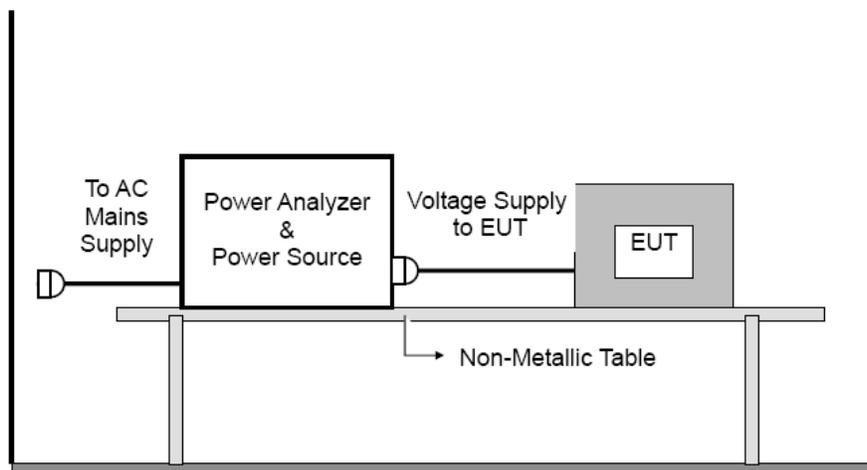
(2)7 % for equipment which is

- a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

6.4.2. Test Procedure

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions
- b. During the flick measurement, the measure time shall include that part of whole operation changes according to IEC/EN 61000-3-3 Annex A for each product type has different requirement.
- c. Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
- d. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

6.4.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

6.4.4. Test Condition

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 62%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 9, 2021 |

6.4.5. Test Result

Mode 2 :

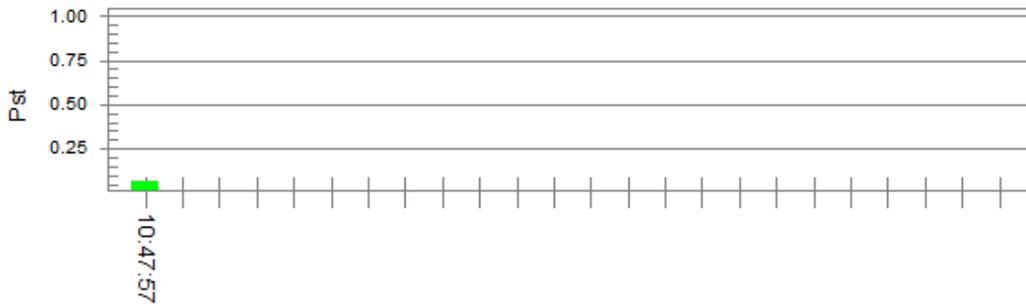
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

Test Result: Pass

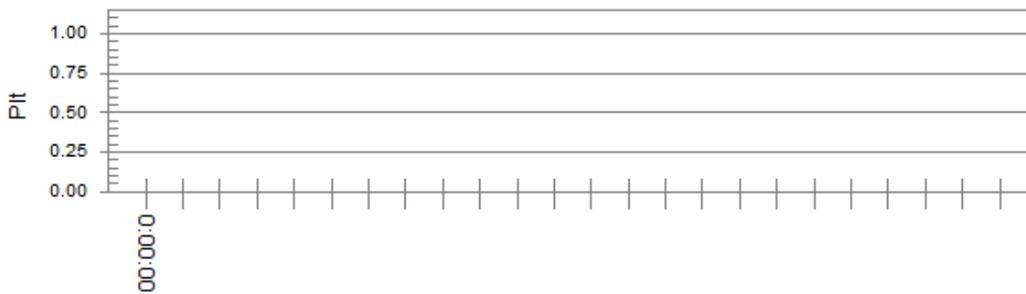
Status: Test Completed

Pstj and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

| | | | | |
|---------------------------------|--------|------------------|-------|------|
| Vrms at the end of test (Volt): | 229.85 | Test limit (%): | N/A | N/A |
| Highest dt (%): | 0.00 | Test limit (mS): | 500.0 | Pass |
| T-max (mS): | 0 | Test limit (%): | 3.30 | Pass |
| Highest dc (%): | 0.00 | Test limit (%): | 4.00 | Pass |
| Highest dmax (%): | 0.00 | Test limit: | 1.000 | Pass |
| Highest Pst (10 min. period): | 0.064 | Test limit: | 0.650 | Pass |
| Highest Plt (2 hr. period): | 0.028 | | | |

7. IMMUNITY TEST

7.1. Performance Criteria

According to EN 55024/ EN 55035 standard, the general performance criteria as following:

| | |
|-------------------|--|
| Criteria A | <p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.</p> <p>The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p> |
| Criteria B | <p>During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.</p> <p>After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p> |
| Criteria C | <p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.</p> <p>Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p> |

7.2. Electrostatic Discharge Immunity Test

7.2.1. Test Specification

For EN 55024 & EN 55035

| | |
|-------------------------------------|---|
| Standard: | EN 55024(Note)/ EN 55035 (refer to IEC/EN 61000-4-2) |
| Discharge Impedance: | 330(1±10%)Ω / 150(1±10%)pF |
| Discharge Voltage: | Air Discharge: ±2kV/±4kV/±8kV (Direct) |
| Polarity: | Contact Discharge: ±2kV/±4kV (Direct/Indirect) Positive and Negative |
| Discharge Mode of Operation: | Single discharges |
| Discharge Period: | 1 second minimum |

7.2.2. Test Procedure

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. On each pre-selected point at least 10 single discharges (at each polarity) shall be applied. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

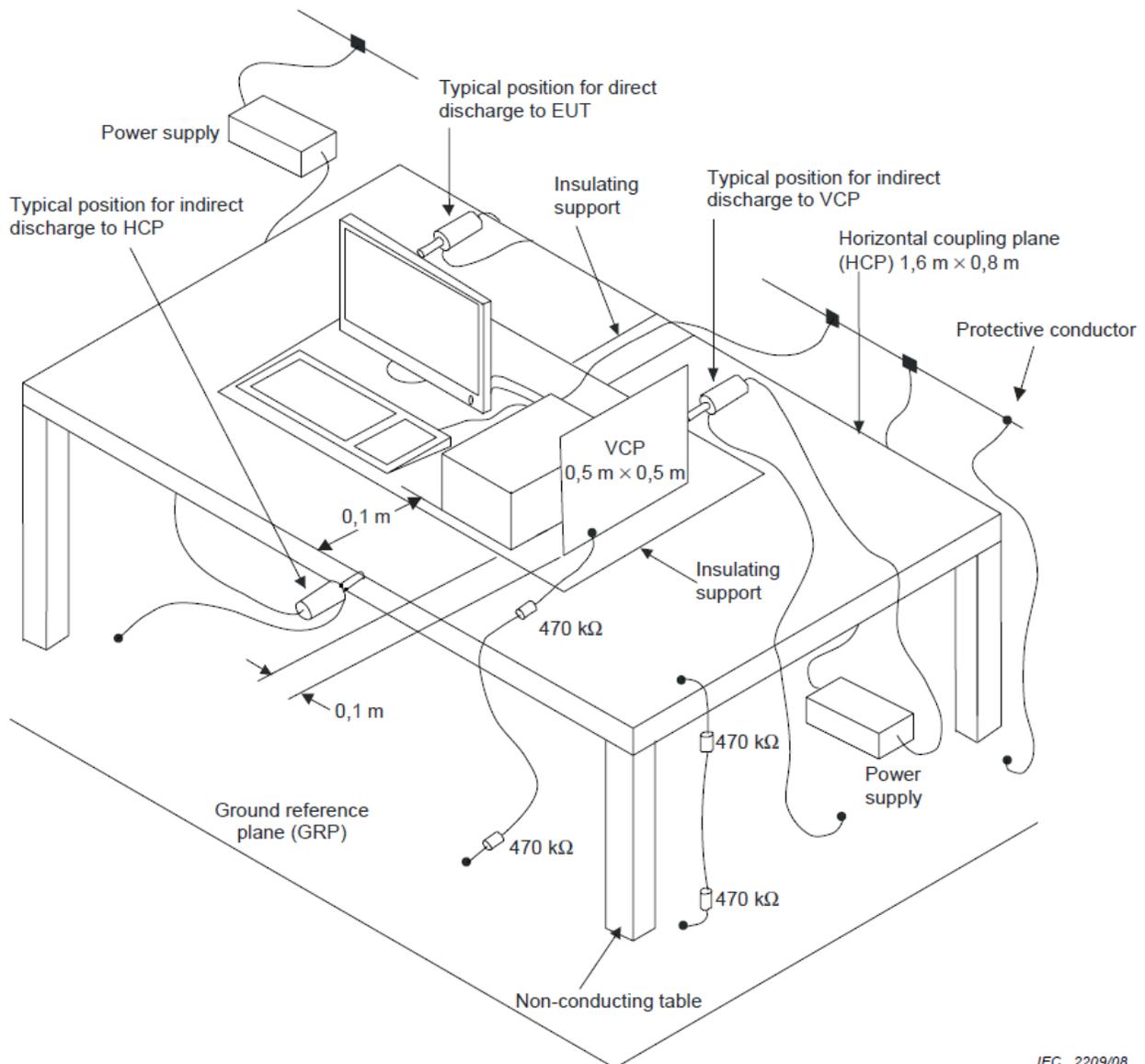
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

For EN 55024, Step a shall be change to 25 single discharges at each polarity.

- b. Air discharges at insulation surfaces of the EUT.
It was at least 10 single discharges with positive and negative at the same selected point.
- c. For the actual test configuration, please refer to the related Item :EUT Test Photos.

7.2.3. Test Setup



A distance of 0,8 m minimum shall be provided between the EUT and the walls of the laboratory and any other metallic structure.

For the actual test configuration, please refer to Appendix I : Photographs of the Test Configuration.

7.2.4. Test Result

EN 55024 :

| | | | |
|---------------------|------------------------------------|---------------|--------------|
| Test Mode: | Mode 1 | Temperature: | 24°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 42%RH |
| Discharge of times: | Air: 10 times Contact: 25 times | ATM pressure: | 1018 hpa |
| Tested By: | Rupert Huang | Test Date: | Jul. 7, 2021 |

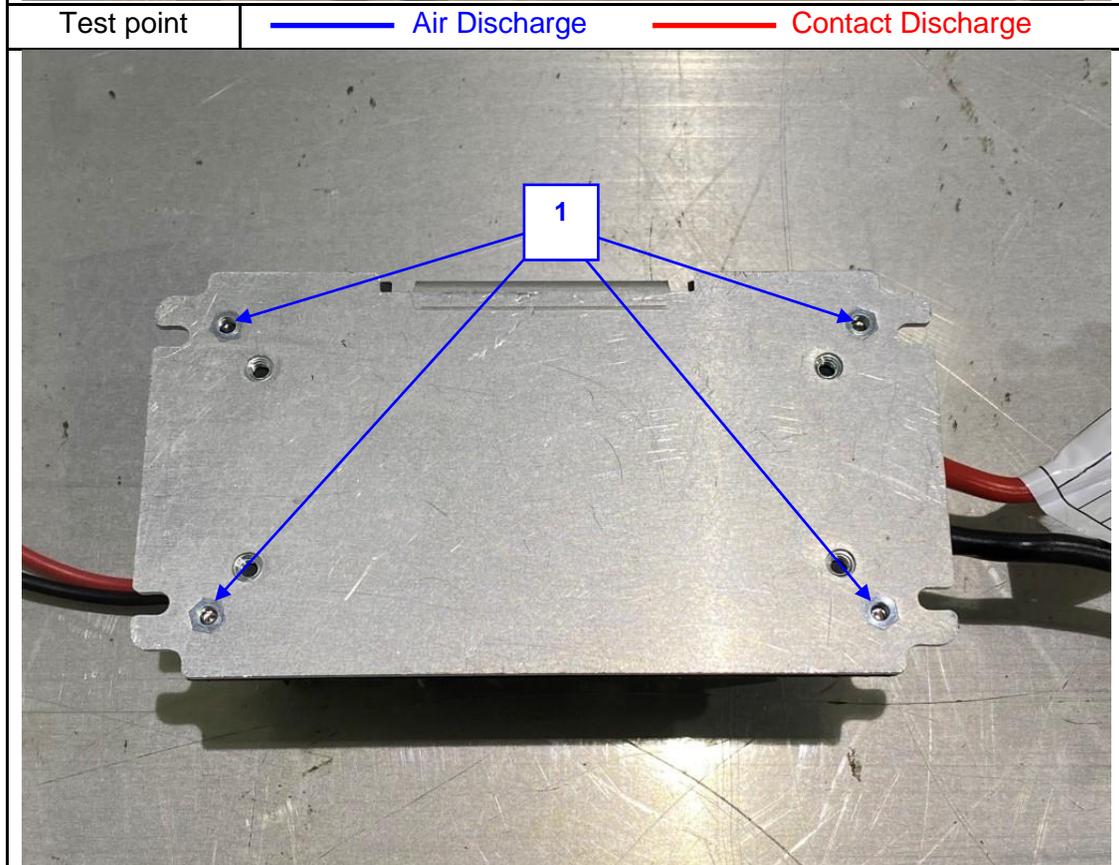
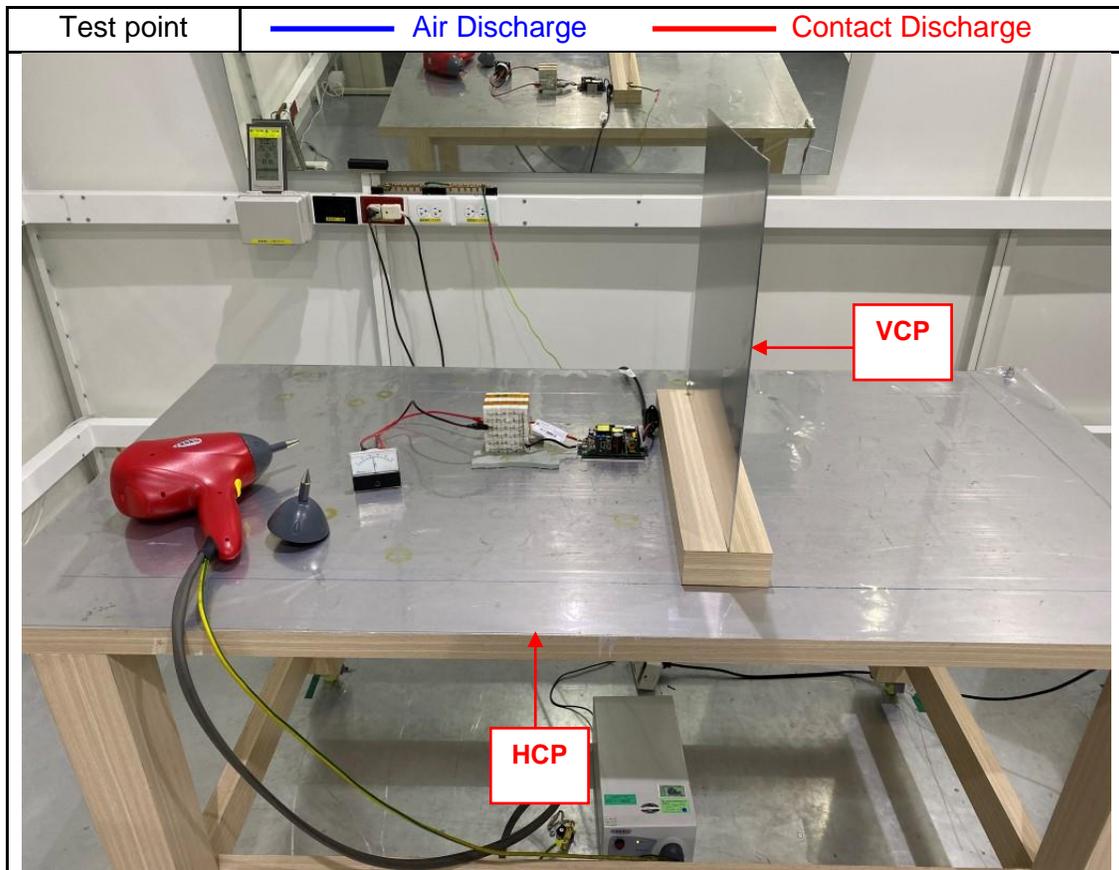
| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1 | A | A | A | A | A | A | - | - | - | - | - | - | - | - | - | - |
| 2 | - | - | - | - | - | - | - | - | A | A | A | A | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | - | | | | | | | |
| Judgment | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

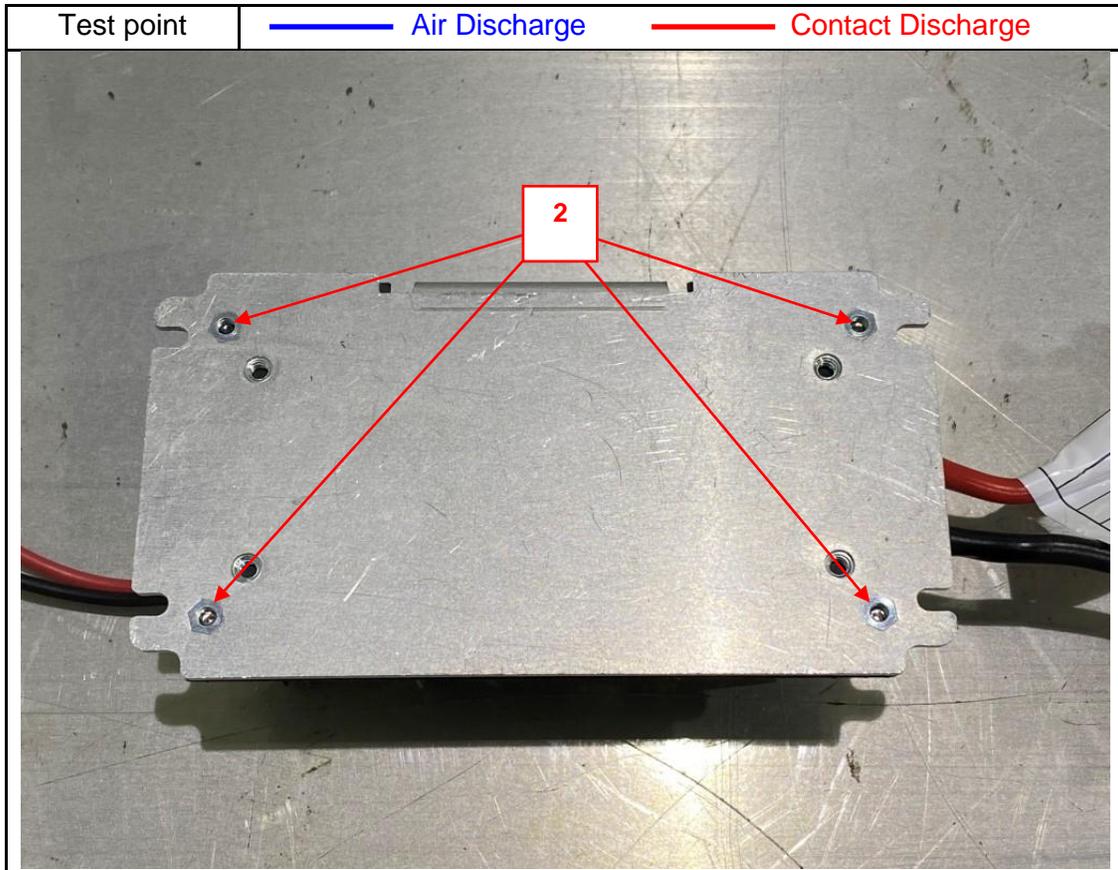
| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | -kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| rear | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| left | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| right | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| Criteria | B | | | | - | | | | B | | | | - | | | |
| Results | A | | | | - | | | | A | | | | - | | | |
| Judgment | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

Customer Request:

| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|------|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | 15kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1 | - | - | - | - | - | - | A | A | - | - | - | - | - | - | - | - |
| 2 | - | - | - | - | - | - | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgment | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| rear | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| left | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| right | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgment | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |





| | | | |
|---------------------|------------------------------------|---------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 24°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 42%RH |
| Discharge of times: | Air: 10 times Contact: 25 times | ATM pressure: | 1018 hpa |
| Tested By: | Rupert Huang | Test Date: | Jul. 7, 2021 |

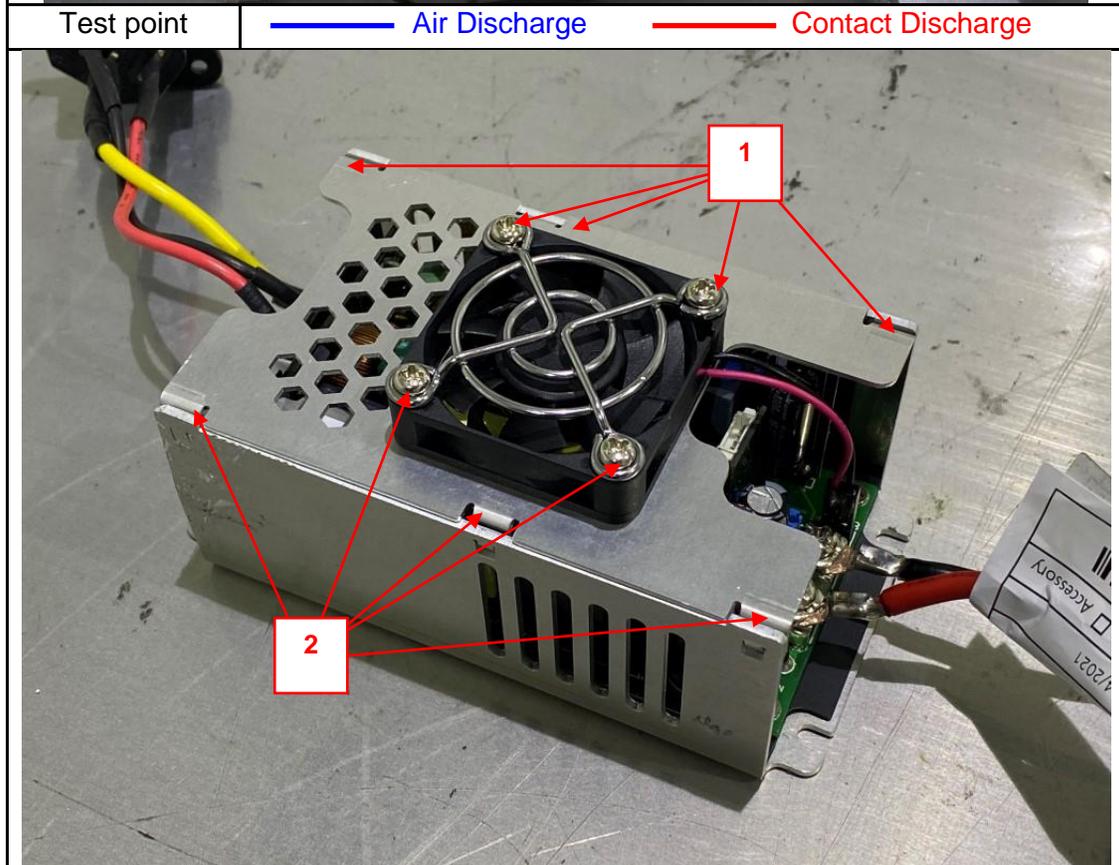
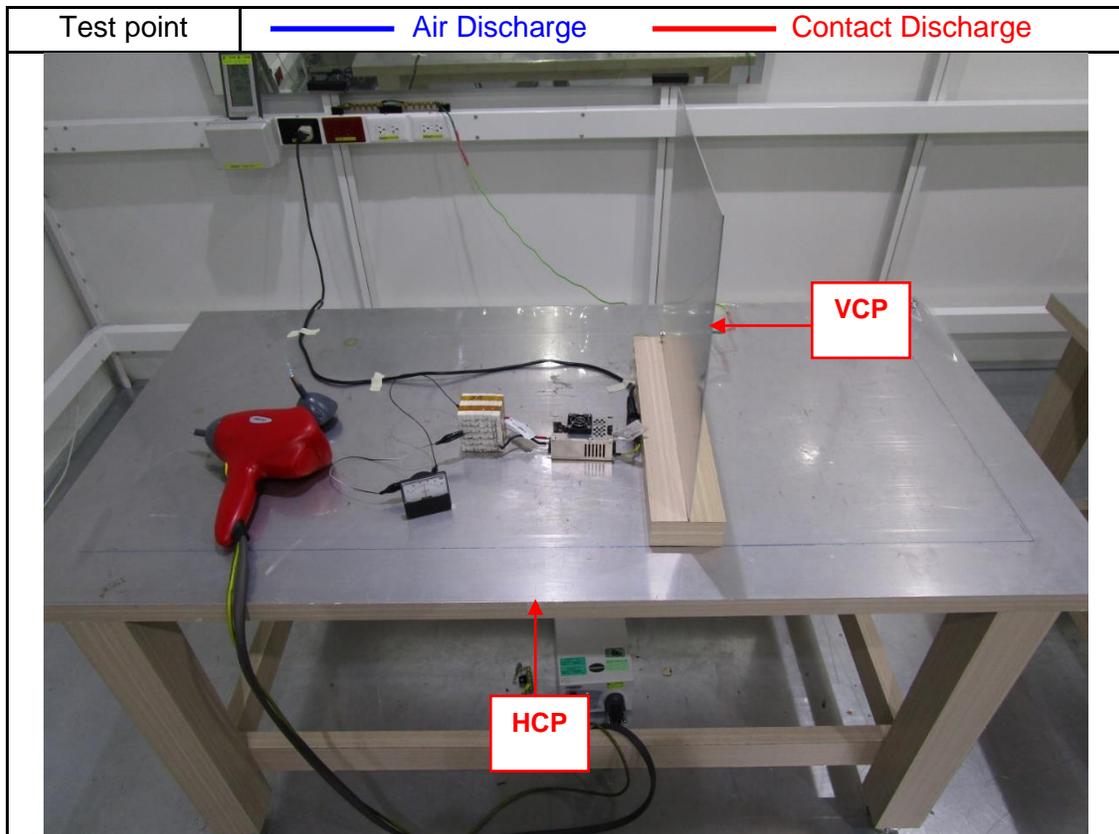
| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1,2,7,8 | - | - | - | - | - | - | - | - | A | A | A | A | - | - | - | - |
| 3~6 | A | A | A | A | A | A | - | - | - | - | - | - | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgment | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

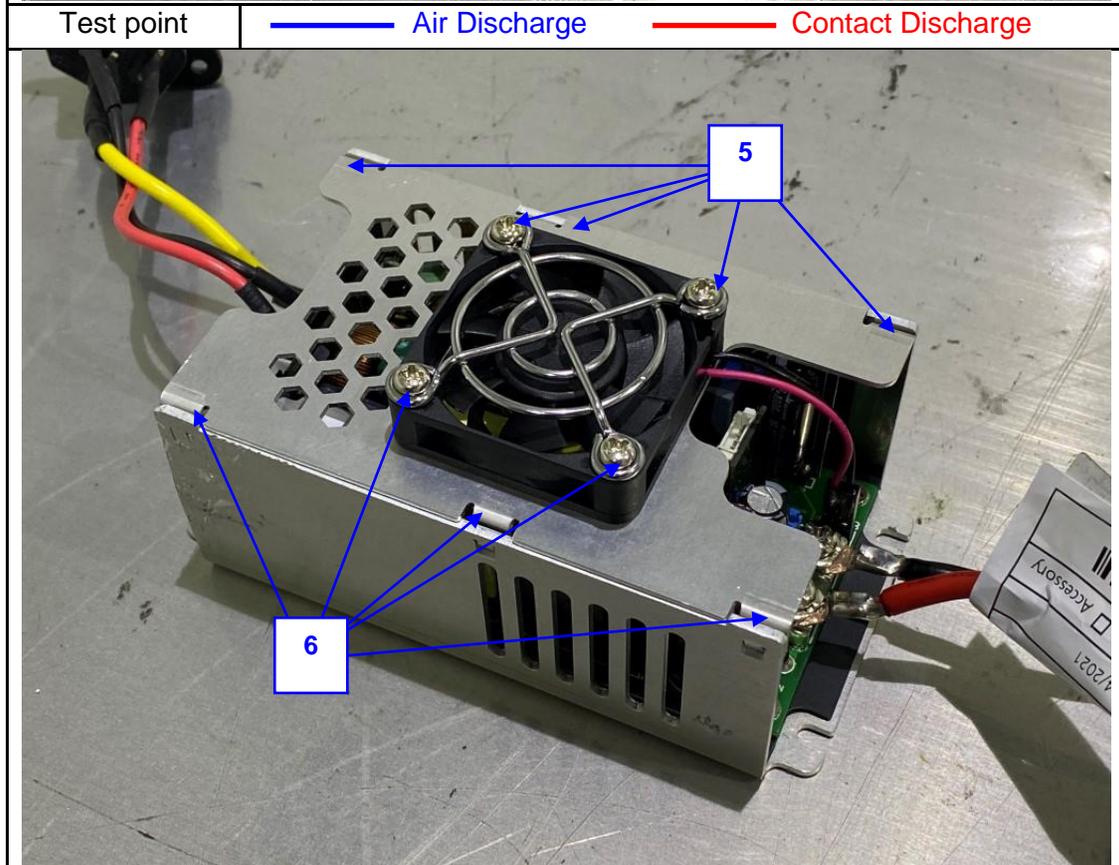
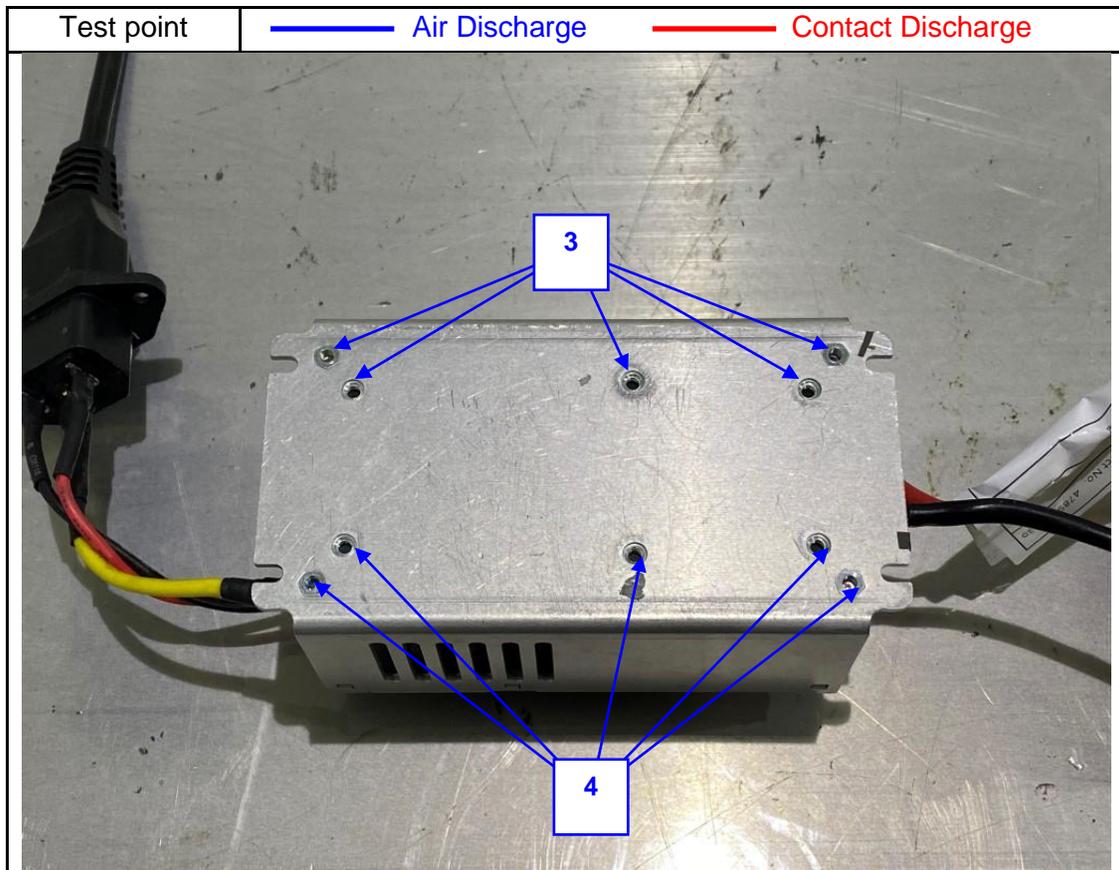
| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | -kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| rear | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| left | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| right | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| Criteria | B | | | | - | | | | B | | | | - | | | |
| Results | A | | | | - | | | | A | | | | - | | | |
| Judgment | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

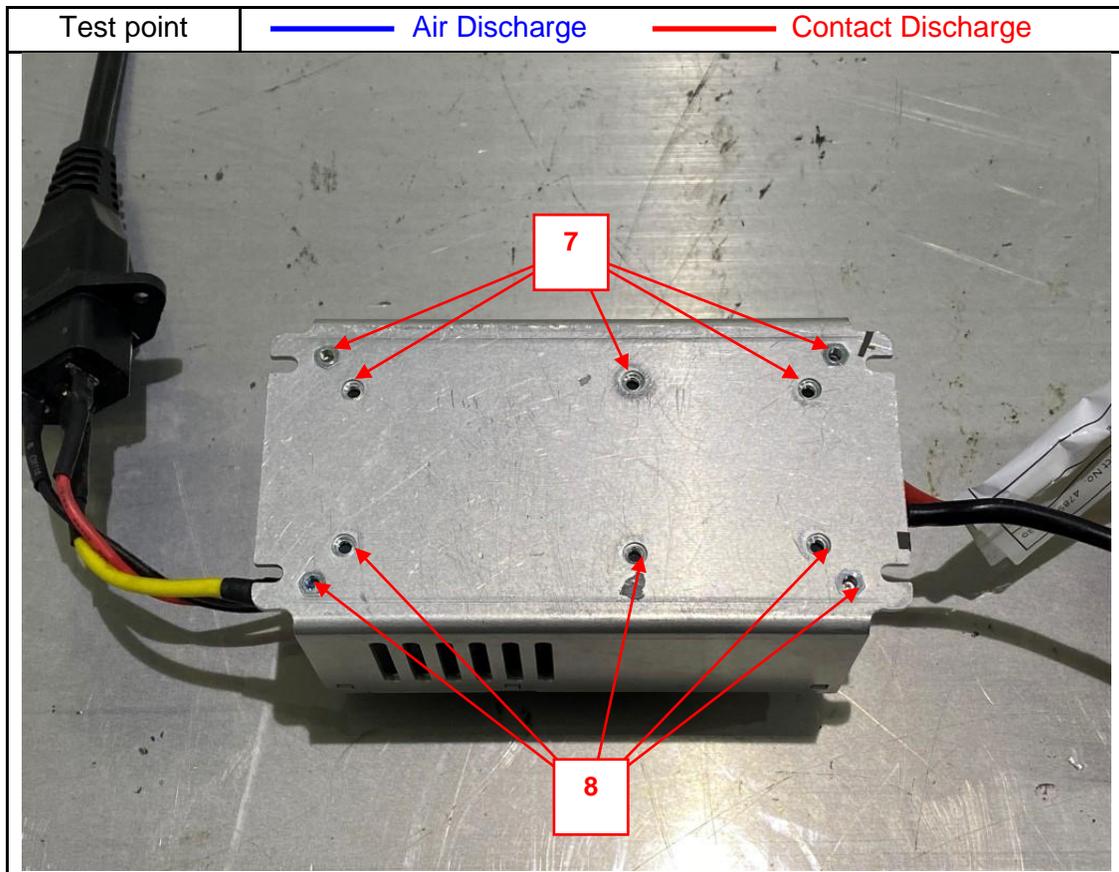
Customer Request:

| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|------|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | 15kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1~2, 7~8 | - | - | - | - | - | - | - | - | - | - | - | - | A | A | - | - |
| 3~6 | - | - | - | - | - | - | A | A | - | - | - | - | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgment | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| rear | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| left | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| right | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgment | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |







EN 55035:

| | | | |
|---------------------|------------------------------------|---------------|--------------|
| Test Mode: | Mode 1 | Temperature: | 24°C |
| Test Voltage: | 230V/50Hz | Humidity: | 42%RH |
| Discharge of times: | Air: 10 times Contact: 10 times | ATM pressure: | 1018 hpa |
| Tested By: | Rupert Huang | Test Date: | Jul. 7, 2021 |

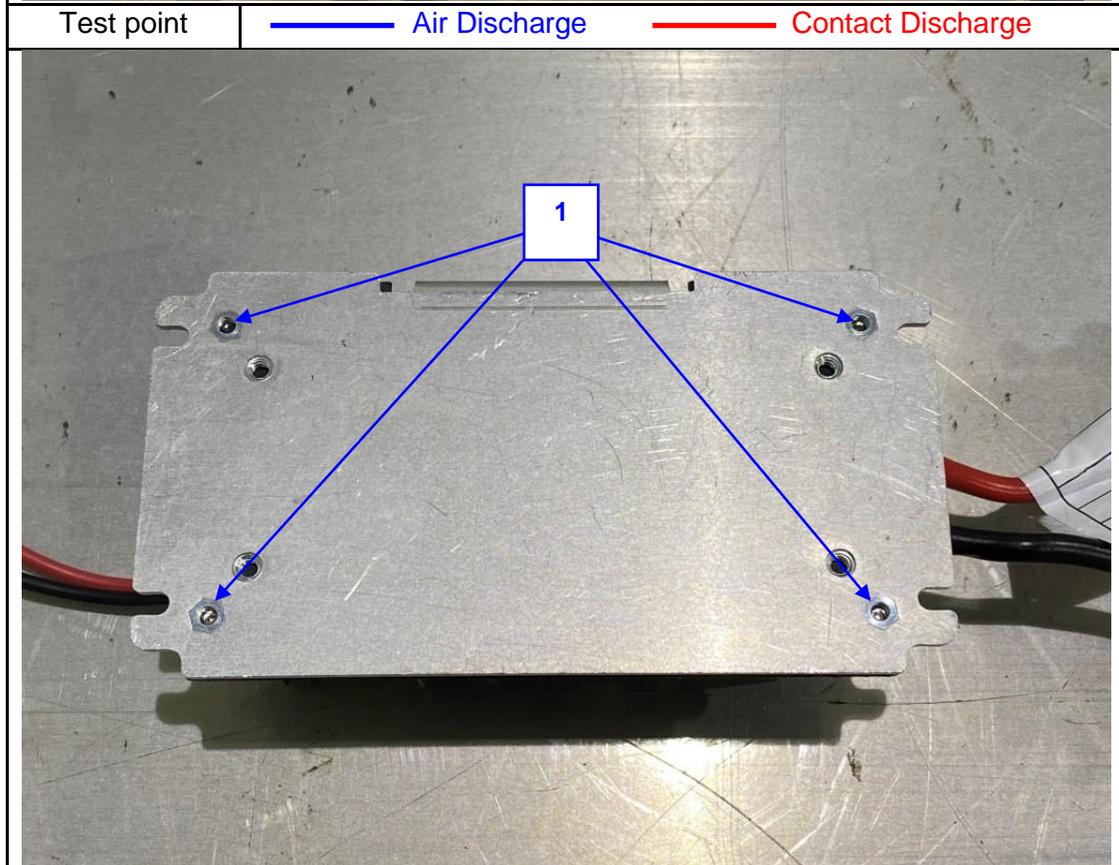
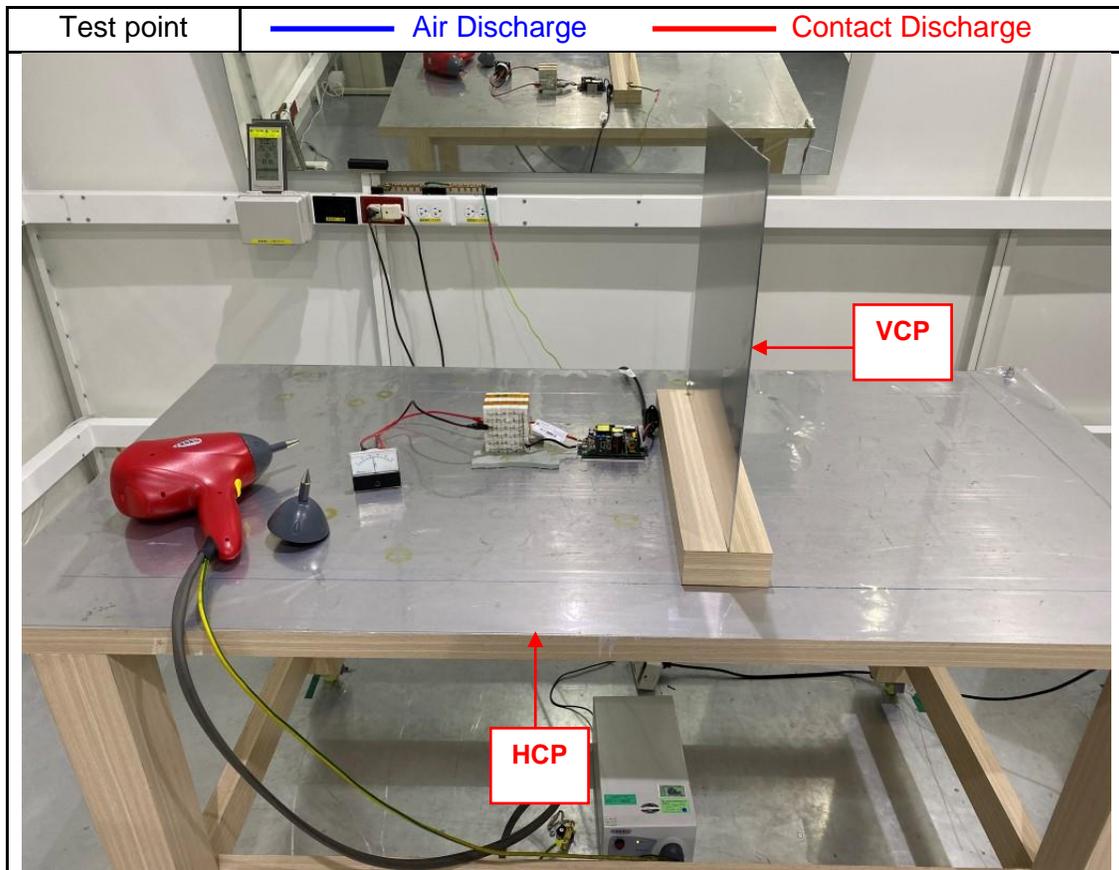
| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1 | - | - | - | - | - | - | - | - | A | A | A | A | - | - | - | - |
| 2 | A | A | A | A | A | A | - | - | - | - | - | - | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

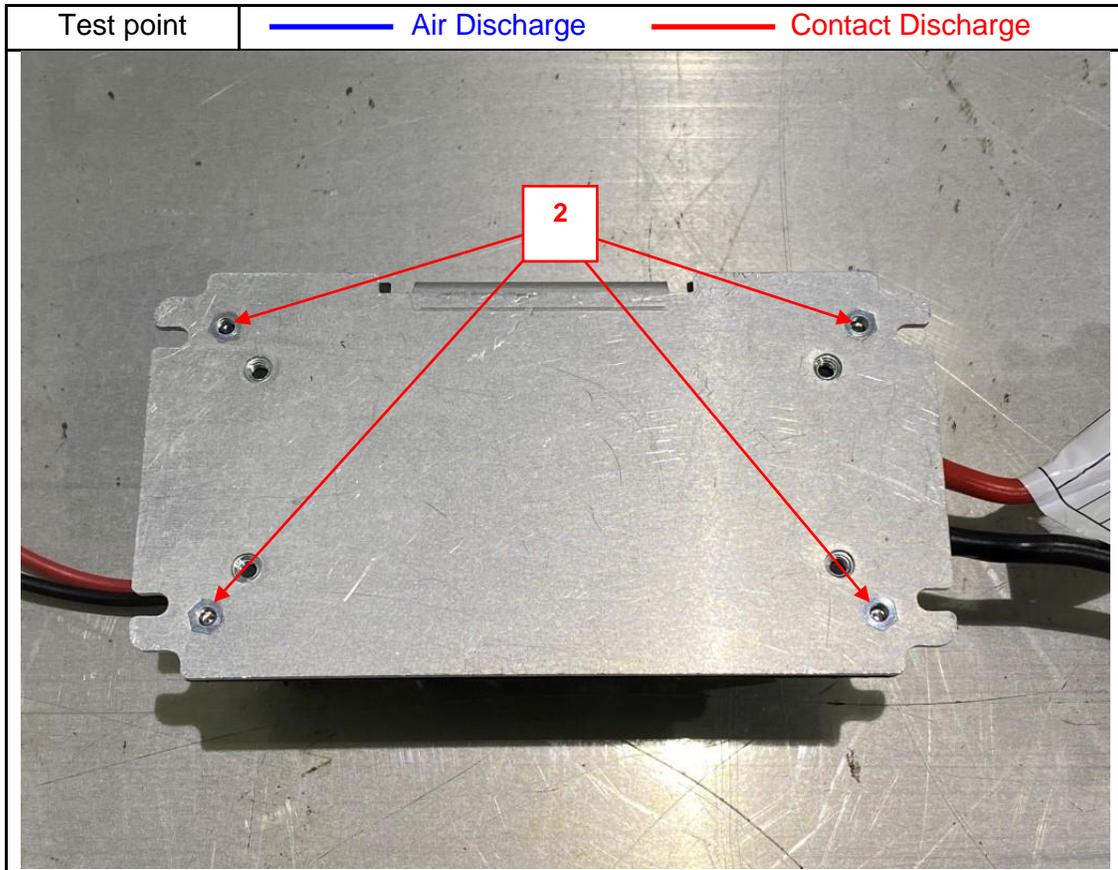
| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | -kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| rear | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| left | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| right | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| Criteria | B | | | | - | | | | B | | | | - | | | |
| Results | A | | | | - | | | | A | | | | - | | | |
| Judgement | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

Customer Request:

| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|------|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | 15kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1 | - | - | - | - | - | - | A | A | - | - | - | - | - | - | - | - |
| 2 | - | - | - | - | - | - | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| rear | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| left | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| right | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |





| | | | |
|---------------------|------------------------------------|---------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 24°C |
| Test Voltage: | 230V/50Hz | Humidity: | 42%RH |
| Discharge of times: | Air: 10 times Contact: 10 times | ATM pressure: | 1018 hpa |
| Tested By: | Rupert Huang | Test Date: | Jul. 7, 2021 |

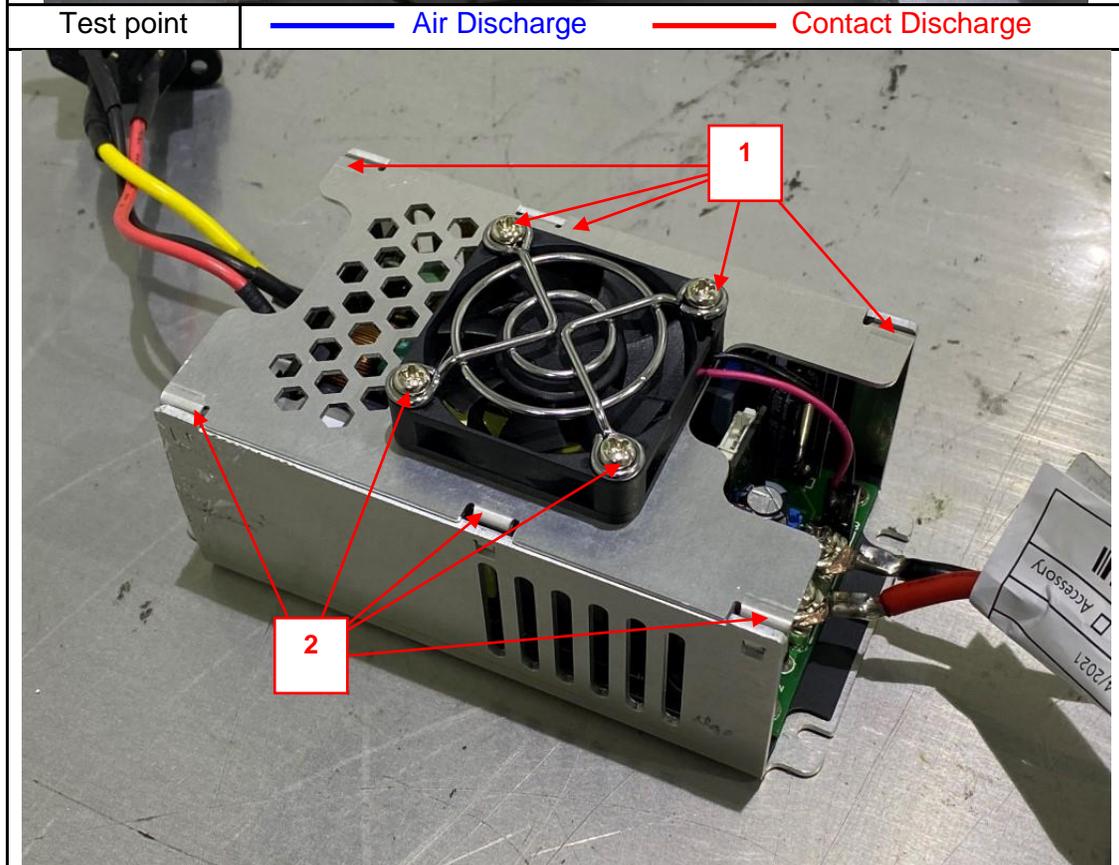
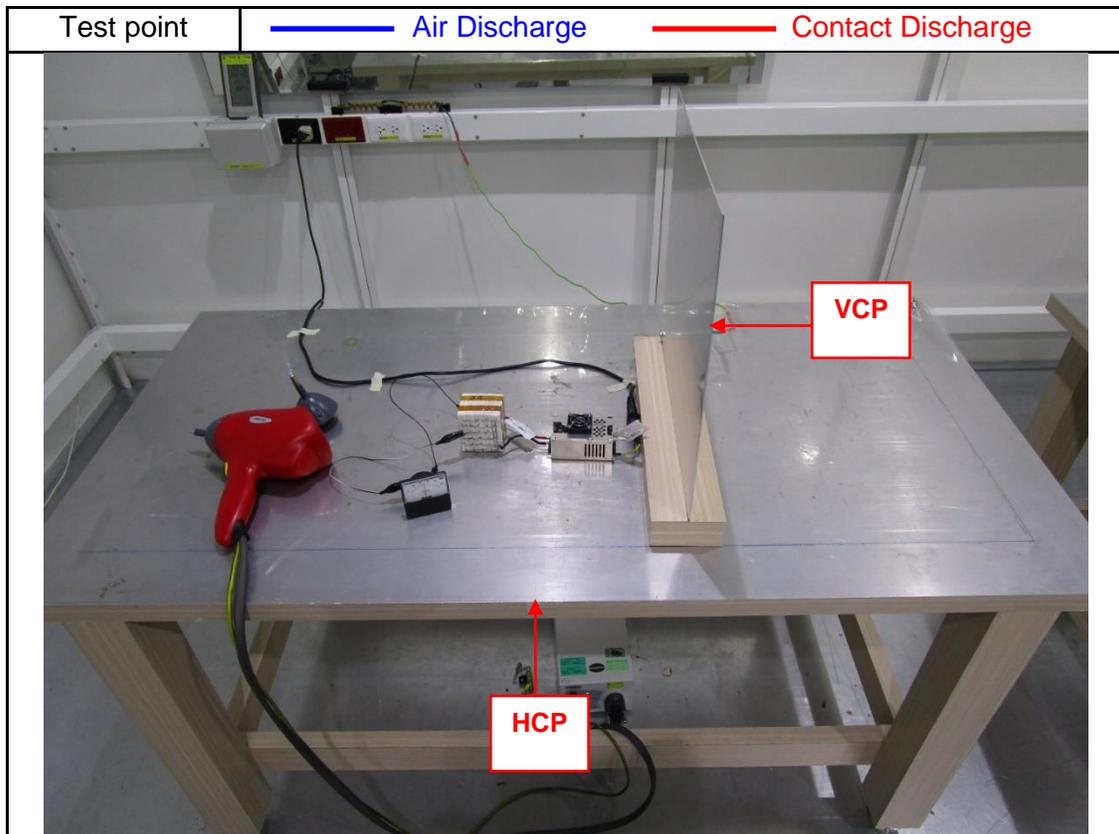
| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1,2,7,8 | - | - | - | - | - | - | - | - | A | A | A | A | - | - | - | - |
| 3~6 | A | A | A | A | A | A | - | - | - | - | - | - | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

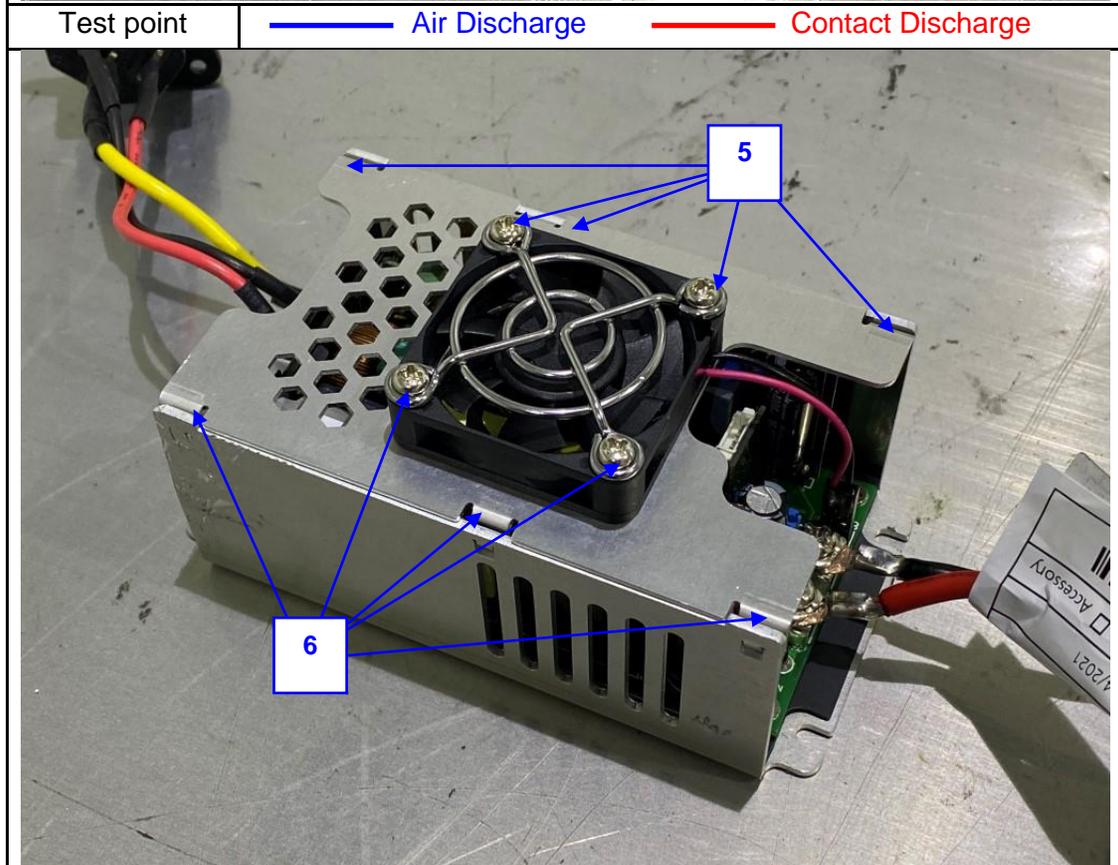
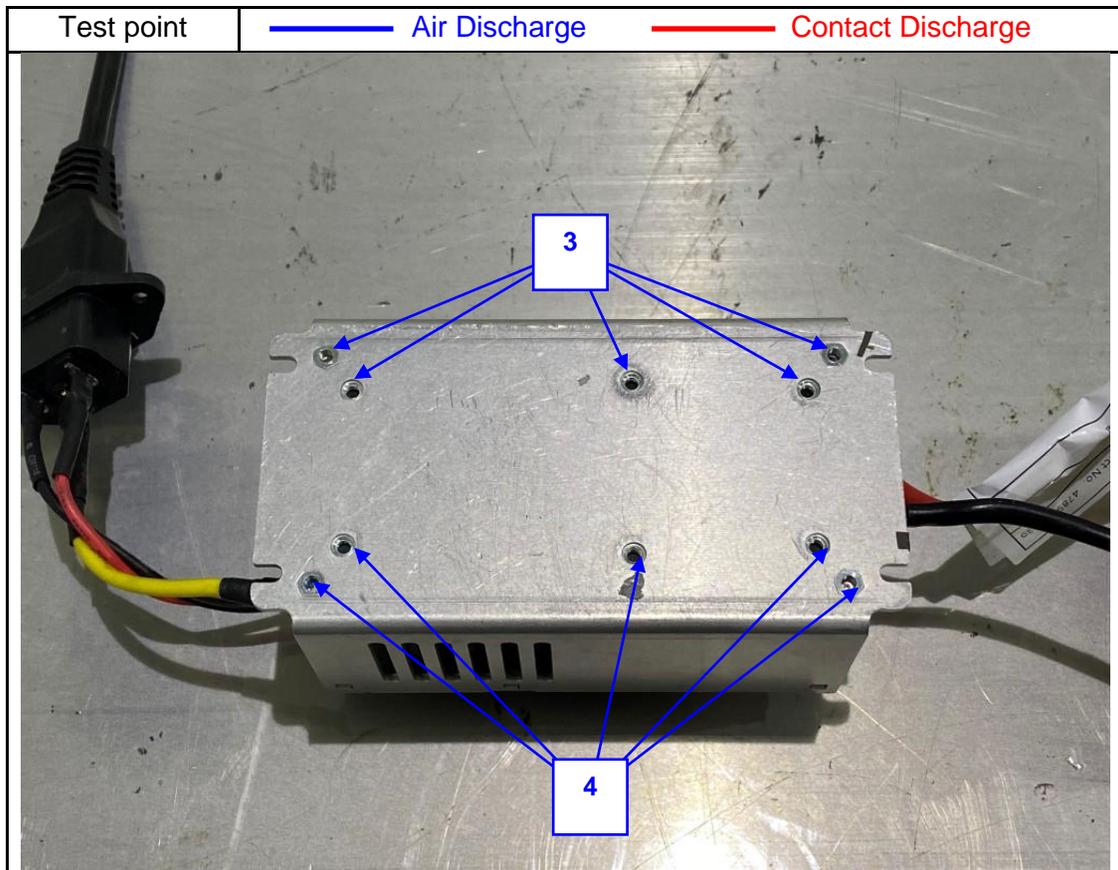
| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | -kV | | -kV | | 2kV | | 4kV | | -kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| rear | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| left | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| right | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| Criteria | B | | | | - | | | | B | | | | - | | | |
| Results | A | | | | - | | | | A | | | | - | | | |
| Judgement | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

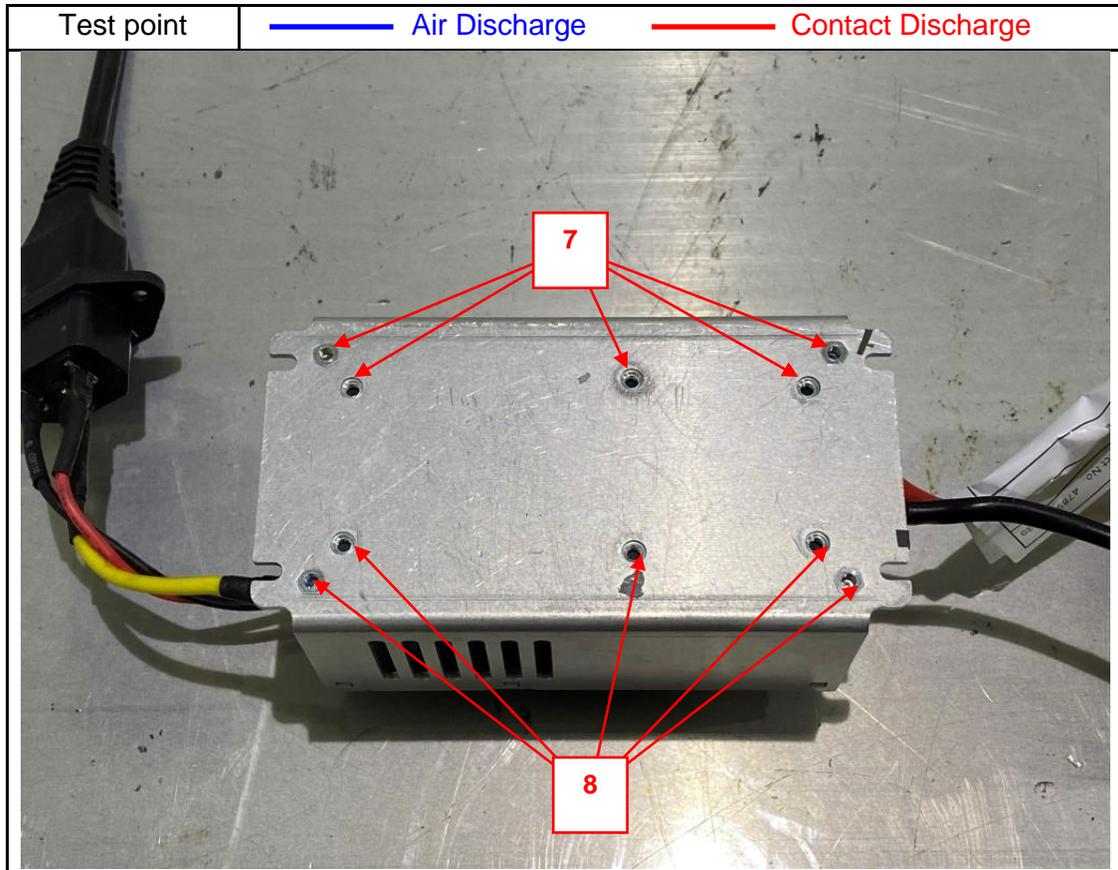
Customer Request:

| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|------|---|-------------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | 15kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 1,2,7,8 | - | - | - | - | - | - | - | - | - | - | - | - | A | A | - | - |
| 3~6 | - | - | - | - | - | - | A | A | - | - | - | - | - | - | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | - | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |

| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|-----------|--|---|-----|---|-----|---|-----|---|---------------|---|-----|---|-----|---|-----|---|
| | 2kV | | 4kV | | 8kV | | -kV | | 2kV | | 4kV | | 8kV | | -kV | |
| Location | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| front | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| rear | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| left | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| right | - | - | - | - | A | A | - | - | - | - | - | - | A | A | - | - |
| Criteria | B | | | | | | | | B | | | | | | | |
| Results | A | | | | | | | | A | | | | | | | |
| Judgement | PASS | | | | | | | | | | | | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | | | | | | | |







7.3. Radio Frequency Electromagnetic Field Immunity Test

7.3.1. Test Specification

For Standard EN 55024 :

| | |
|----------------------------|--------------------------------------|
| Standard: | EN 55024 (refer to IEC/EN 61000-4-3) |
| Frequency Range: | 80 MHz to 1000MHz |
| Field Strength: | 3V/m (unmodulated) |
| Modulation: | 80%, AM(1 kHz) |
| Frequency Step: | 1% |
| Polarity of Antenna | Vertical and Horizontal |
| Test Distance: | 3 meters |
| Antenna Height: | 1.55 meters |
| Dwell Time: | 3 s |

For Standard EN 55035 :

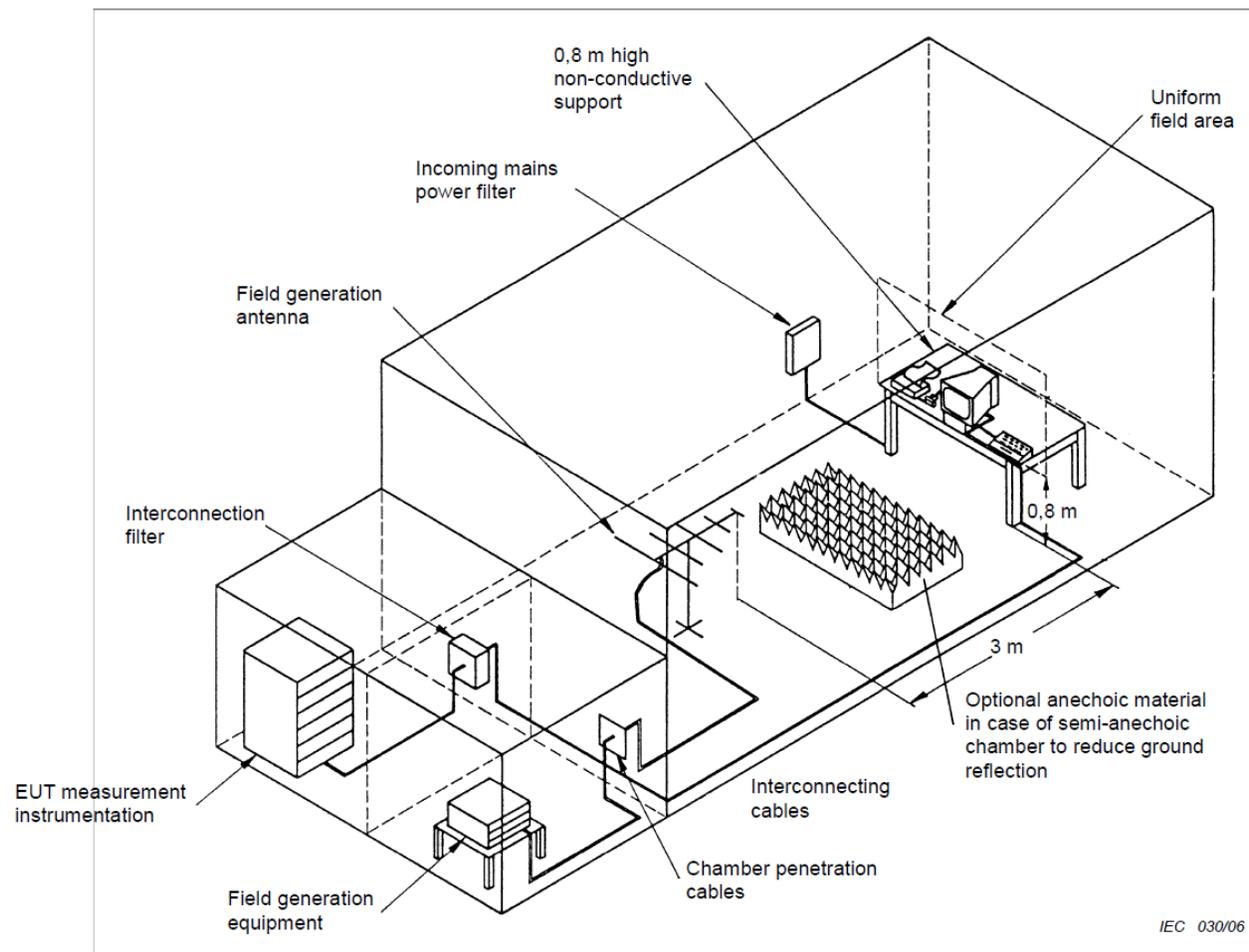
| | |
|---|--|
| Standard: | EN 55035 (refer to IEC/EN 61000-4-3) |
| Frequency Range: | 80 MHz to 1000MHz |
| Spot Frequency: | 1800, 2600, 3500, 5000 MHz($\pm 1\%$) |
| Field Strength: | 3V/m (unmodulated) |
| Immunity level to common wireless communication: | See Table I.1 for test frequency and level |
| Modulation: | 80%, AM(1 kHz) |
| Frequency Step: | 1% |
| Polarity of Antenna | Vertical and Horizontal |
| Test Distance: | 3 meters |
| Antenna Height: | 1.55 meters |
| Dwell Time: | 3 s |

7.3.2. Test Procedure

The test procedure was in accordance with IEC/EN 61000-4-3.

- a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- b. The frequency range is swept from 80 MHz to 1000MHz with the signal 80% amplitude modulated with a 1 KHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- d. The field strength level from 80 MHz to 1000MHz was 3V/m.
- e. A special spot frequency test point are 1800, 2600, 3500 and 5000MHz ($\pm 1\%$)
- f. Wireless communication devices are considered to be the most significant sources of interference for MME in the range 800 MHz to 5 GHz. Consequently testing is only required at relevant spot frequencies refer to EN 55035 Annex I.
- g. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

7.3.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.3.4. Test Result

EN 55024 :

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 23°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 53%RH |
| Tested By: | Rupert Huang | Test Date: | Apr. 7, 2021 |

| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgment |
|-------------------|-------------------|-------------------|----------------------|----------|---------|----------|
| 80-1000 | Front | H / V | 3V/m | A | A | PASS |
| 80-1000 | Left | H / V | 3V/m | A | A | PASS |
| 80-1000 | Right | H / V | 3V/m | A | A | PASS |
| 80-1000 | Rear | H / V | 3V/m | A | A | PASS |

| | |
|------|--|
| Note | There was no abnormal situation during the test compared with initial operation. |
|------|--|

Customer request :

| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgment |
|-------------------|-------------------|-------------------|----------------------|----------|---------|----------|
| 80-1000 | Front | H / V | 20V/m | A | A | PASS |
| 80-1000 | Left | H / V | 20V/m | A | A | PASS |
| 80-1000 | Right | H / V | 20V/m | A | A | PASS |
| 80-1000 | Rear | H / V | 20V/m | A | A | PASS |

| | |
|------|--|
| Note | There was no abnormal situation during the test compared with initial operation. |
|------|--|

EN 55035 :

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 23°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 53%RH |
| Tested By: | Rupert Huang | Test Date: | Apr. 7, 2021 |

| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
|-------------------|--|-------------------|----------------------|----------|---------|-----------|
| 80-1000 | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Immunity Level to common wireless communication | | | | | | |
|---|--|-------------------|----------------------|----------|---------|-----------|
| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
| 800(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 900(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 3V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

Customer request:

| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
|-------------------|--|-------------------|----------------------|----------|---------|-----------|
| 80-1000 | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Immunity Level to common wireless communication | | | | | | |
|---|--|-------------------|----------------------|----------|---------|-----------|
| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
| 800(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 900(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 10V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
|-------------------|--|-------------------|----------------------|----------|---------|-----------|
| 80-1000 | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Immunity Level to common wireless communication | | | | | | |
|---|--|-------------------|----------------------|----------|---------|-----------|
| Freq. Range (MHz) | Position (Face) | Polarity (H or V) | Field Strength (V/m) | Criteria | Results | Judgement |
| 800(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 900(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 1800(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 2600(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 3500(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| 5000(±1%) | Front / Left / Right / Rear | H / V | 20V/m | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

7.4. Electrical Fast Transient/Burst Immunity Test

7.4.1. Test Specification

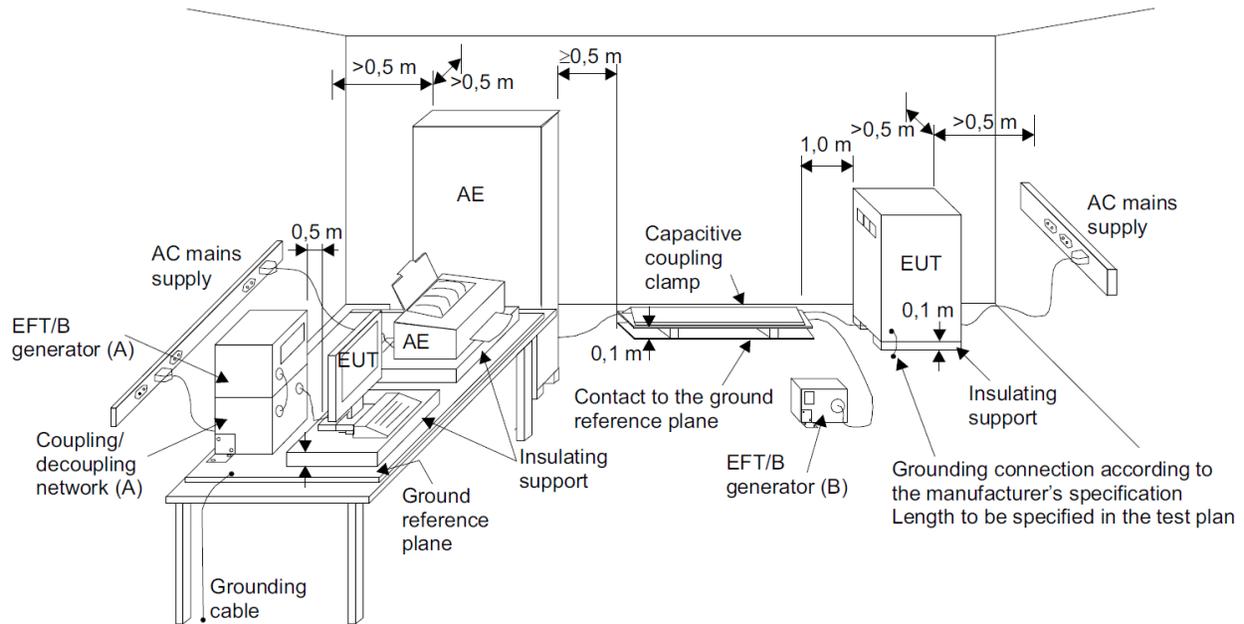
For Standard EN 55024 & EN 55035 :

| | |
|----------------------------|---|
| Standard: | EN 55024/ EN55035 (refer to IEC/EN 61000-4-4) |
| Test Voltage: | 0.5,1 kV(Peak) |
| Polarity: | Positive and Negative |
| Impulse Frequency: | 5 or 100 kHz |
| Impulse wave shape: | 5/50 Tr/Th ns |
| Burst Duration: | 15ms or 0.75ms |
| Burst Period: | 300ms |
| Test Duration: | 1 Minute |

7.4.2. Test Procedure

- a. The EUT was tested with 1000 volt discharges to the AC power input leads, 500 volt discharges to the signal/control ports.
- b. Both positive and negative polarity discharges were applied.
- c. Table-top equipment and equipment normally mounted on ceilings or walls as well as built-in equipment shall be tested with the EUT located $(0,1 \pm 0,01)$ m above the ground reference plane.
- d. The EUT and the auxiliary equipment were placed on a table of 0.8 m heights above a metal ground reference plane. The size of ground plane is greater than 0.8m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The minimum distance between the EUT and all other conductive structures (including the generator, AE and the walls of a shielded room), except the ground reference plane, shall be more than 0,5 m.
- e. The duration time of each test sequential was 1 minute.
- f. The transient/burst waveform was in accordance with IEC/EN 61000-4-4, 5/50ns.

7.4.3. Test Setup



IEC 645/12

- (A) location for supply line coupling
- (B) location for signal lines coupling

For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.4.4. Test Result

EN 55024 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| Repetition Frequency | | 5kHz | | | | | | Criteria | Results | Judgement |
|----------------------|--|------------------|------|------|------|---|---|----------|---------|-----------|
| Test Port | | Test Levels (kV) | | | | | | | | |
| | | +0.5 | -0.5 | +1.0 | -1.0 | - | - | | | |
| AC power Port | L | - | - | A | A | - | - | B | A | PASS |
| | N | - | - | A | A | - | - | | | |
| | PE | - | - | A | A | - | - | | | |
| | L + N | - | - | A | A | - | - | | | |
| | L + PE | - | - | A | A | - | - | | | |
| | N + PE | - | - | A | A | - | - | | | |
| | L+N+PE | - | - | A | A | - | - | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | |

Customer Request:

| Repetition Frequency | | 5kHz | | | | | | Criteria | Results | Judgement |
|----------------------|--|------------------|------|------|------|------|------|----------|---------|-----------|
| Test Port | | Test Levels (kV) | | | | | | | | |
| | | +0.5 | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | | | |
| AC power Port | L | - | - | - | - | A | A | B | A | PASS |
| | N | - | - | - | - | A | A | | | |
| | PE | - | - | - | - | A | A | | | |
| | L + N | - | - | - | - | A | A | | | |
| | L + PE | - | - | - | - | A | A | | | |
| | N + PE | - | - | - | - | A | A | | | |
| | L+N+PE | - | - | - | - | A | A | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | |

EN 55035 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| Repetition Frequency | | 5kHz | | | | | | Criteria | Results | Judgement |
|----------------------|--|------------------|------|------|------|---|---|----------|---------|-----------|
| Test Port | | Test Levels (kV) | | | | | | | | |
| | | +0.5 | -0.5 | +1.0 | -1.0 | - | - | | | |
| AC power Port | L | - | - | A | A | - | - | B | A | PASS |
| | N | - | - | A | A | - | - | | | |
| | PE | - | - | A | A | - | - | | | |
| | L + N | - | - | A | A | - | - | | | |
| | L + PE | - | - | A | A | - | - | | | |
| | N + PE | - | - | A | A | - | - | | | |
| | L+N+PE | - | - | A | A | - | - | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | |

Customer Request:

| Repetition Frequency | | 5kHz | | | | | | Criteria | Results | Judgement |
|----------------------|--|------------------|------|------|------|------|------|----------|---------|-----------|
| Test Port | | Test Levels (kV) | | | | | | | | |
| | | +0.5 | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | | | |
| AC power Port | L | - | - | - | - | A | A | B | A | PASS |
| | N | - | - | - | - | A | A | | | |
| | PE | - | - | - | - | A | A | | | |
| | L + N | - | - | - | - | A | A | | | |
| | L + PE | - | - | - | - | A | A | | | |
| | N + PE | - | - | - | - | A | A | | | |
| | L+N+PE | - | - | - | - | A | A | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | |

7.5. Surge Immunity Test

7.5.1. Test Specification

For Standard EN 55024 :

| | |
|-------------------------|---|
| Standard: | EN 55024 (refer to IEC/EN 61000-4-5) |
| Waveform: | 1.2/50 (8/20) Tr/Th μ s , 10/700 Tr/Th μ s |
| Test Voltage: | 0.5,1 kV(Line to Line) 0.5,1,2 kV(Line to Earth) |
| Polarity: | Positive and Negative |
| Phase Angle: | 0°/90°/180°/270° |
| Repetition Rate: | 1 per minute |
| Times: | 5 times each polarity |

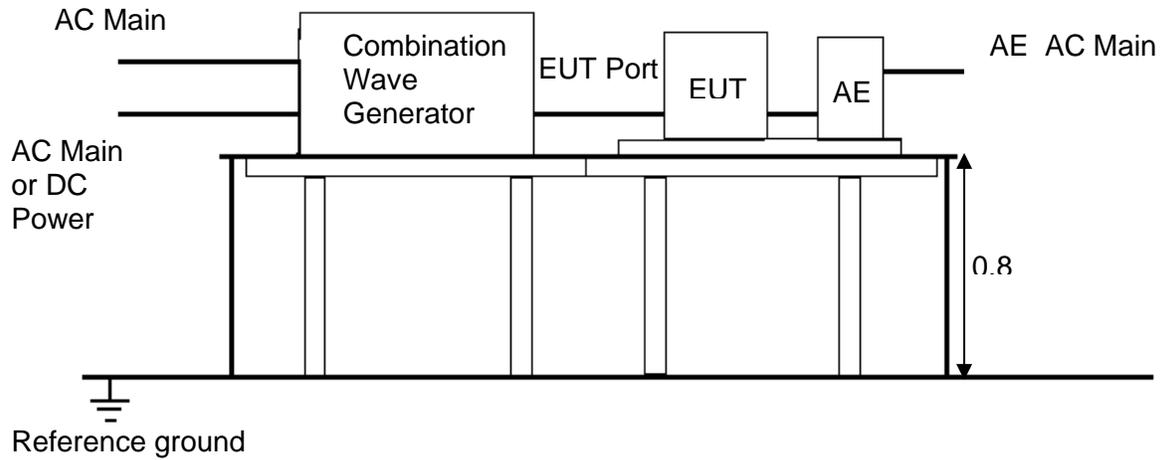
For Standard EN 55035 :

| | |
|-------------------------|---|
| Standard: | EN 55035 (refer to IEC/EN 61000-4-5) |
| Waveform: | 1.2/50 (8/20) Tr/Th μ s , 10/700 Tr/Th μ s |
| Test Voltage: | 0.5,1 kV(Line to Line) 0.5,1,2 kV(Line to Earth) |
| Polarity: | Positive and Negative |
| Phase Angle: | 90°/270° |
| Repetition Rate: | 1 per minute |
| Times: | 5 times each polarity |

7.5.2. Test Procedure

- a. The EUT and the auxiliary equipment were placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT shall not exceed 2 meters (provided by the manufacturer).
- b. The EUT was connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
- c. The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.
- d. If EUT was included telecom port and connected to outdoor directly, test shall be applied to line to earth test using 10/700 surge wave form. If the wave form affects the functioning of high speed data port, the test shall be carried out using 1.2/50 wave form do the test.

7.5.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.5.4. Test Result

EN 55024 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| Wave Form EUT Ports Tested | 1.2/50(8/20)Ti/Th us | | | | | | Criteria | Results | Judgment |
|----------------------------------|--|-------|---------|-----|-----|-----|----------|---------|----------|
| | Polarity | Phase | Voltage | | | | | | |
| | | | 0.5kV | 1kV | 2kV | -kV | | | |
| L - N | + | 0° | A | A | - | - | B | A | PASS |
| | - | | A | A | - | - | | | |
| | + | 90° | A | A | - | - | | | |
| | - | | A | A | - | - | | | |
| | + | 180° | A | A | - | - | | | |
| | - | | A | A | - | - | | | |
| | + | 270° | A | A | - | - | | | |
| - | A | | A | - | - | | | | |
| L - PE | + | 0° | A | A | A | - | B | A | |
| | - | | A | A | A | - | | | |
| | + | 90° | A | A | A | - | | | |
| | - | | A | A | A | - | | | |
| | + | 180° | A | A | A | - | | | |
| | - | | A | A | A | - | | | |
| | + | 270° | A | A | A | - | | | |
| - | A | | A | A | - | | | | |
| N - PE | + | 0° | A | A | A | - | B | A | |
| | - | | A | A | A | - | | | |
| | + | 90° | A | A | A | - | | | |
| | - | | A | A | A | - | | | |
| | + | 180° | A | A | A | - | | | |
| | - | | A | A | A | - | | | |
| | + | 270° | A | A | A | - | | | |
| - | A | | A | A | - | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | |

EN 55035 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| Wave Form EUT Ports Tested | 1.2/50(8/20)Ti/Th us | | | | | | Criteria | Results | Judgement | |
|----------------------------------|--|-------|---------|-----|-----|---|----------|---------|-----------|--|
| | Polarity | Phase | Voltage | | | | | | | |
| | | | 0.5kV | 1kV | 2kV | - | | | | |
| L - N | + | 90° | A | A | - | - | B | A | PASS | |
| | - | 270° | A | A | - | - | | | | |
| L - PE | + | 90° | A | A | A | - | B | A | | |
| | - | | A | A | A | - | | | | |
| | + | 270° | A | A | A | - | | | | |
| | - | | A | A | A | - | | | | |
| N - PE | + | 90° | A | A | A | - | B | A | | |
| | - | | A | A | A | - | | | | |
| | + | 270° | A | A | A | - | | | | |
| | - | | A | A | A | - | | | | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | | | | | |

7.6. Immunity to Conducted Disturbances Induced by RF Fields

7.6.1. Test Specification

For Standard EN 55024 :

| | |
|-------------------------|--------------------------------------|
| Standard: | EN 55024 (refer to IEC/EN 61000-4-6) |
| Frequency Range: | 0.15-80MHz |
| Field Strength: | 3V (unmodulated, r.m.s.) |
| Modulation: | 80% AM (1 kHz) |
| Frequency Step: | 1% |
| Dwell Time: | 3s |

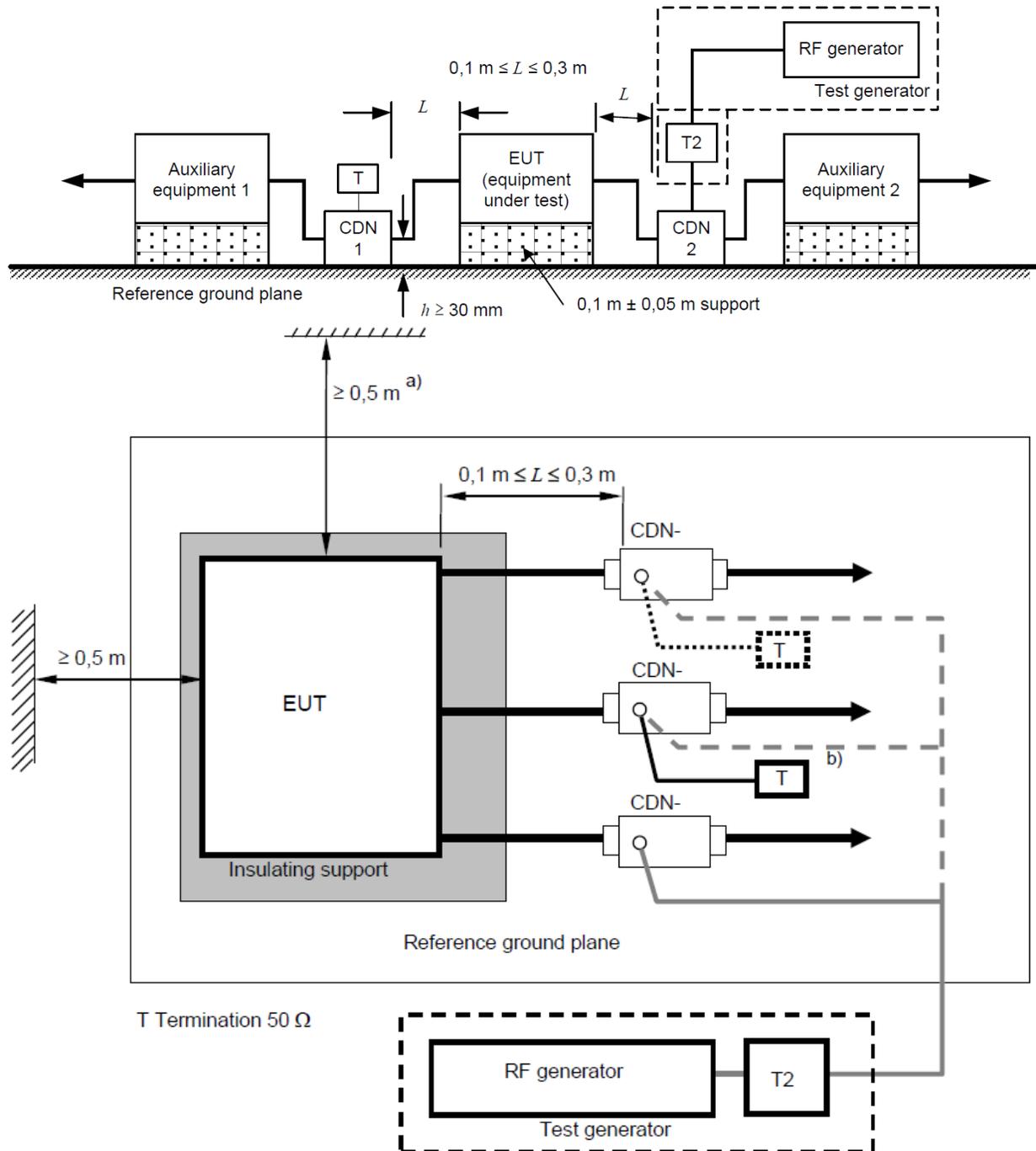
For Standard EN 55035 :

| | |
|-------------------------|---------------------------------------|
| Standard: | EN 55035 (refer to IEC/EN 61000-4-6) |
| Frequency Range: | 0.15-10; 10-30; 30-80MHz |
| Field Strength: | 3V; 3 to 1V; 1V (unmodulated, r.m.s.) |
| Modulation: | 80% AM (1 kHz) |
| Frequency Step: | 1% |
| Dwell Time: | 3s |

7.6.2. Test Procedure

- a. The EUT shall be tested within its intended operating and climatic conditions.
- b. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.
- c. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.
- d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.
- e. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

7.6.3. Test Setup



- a) The EUT clearance from any metallic objects other than test equipment shall be at least 0,5 m.
- b) Only one of the CDNs not used for injection shall be terminated with 50 Ω, providing only a return path. All other CDNs shall be configured as decoupling networks.

For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.6.4. Test Result

EN 55024 :

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 9, 2021 |

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgment |
|-------------------|--|----------------|----------|----------|---------|----------|
| AC Power Port | 0.15 --- 80 | 3V | M016(M3) | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

Customer Request:

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgment |
|-------------------|--|----------------|----------|----------|---------|----------|
| AC Power Port | 0.15 --- 80 | 10V | M016(M3) | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgment |
|-------------------|--|----------------|----------|----------|---------|----------|
| AC Power Port | 0.15 --- 80 | 20V | M016(M3) | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

EN 55035 :

| | | | |
|---------------|--------------|--------------|--------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 9, 2021 |

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgement |
|-------------------|--|----------------|----------|----------|---------|-----------|
| AC Power Port | 0.15 --- 10 | 3V | M016(M3) | A | A | PASS |
| | 10 --- 30 | 3 to 1V | | A | A | PASS |
| | 30 --- 80 | 1V | | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

Customer Request:

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgement |
|-------------------|--|----------------|----------|----------|---------|-----------|
| AC Power Port | 0.15 --- 80 | 10V | M016(M3) | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | CDN | Criteria | Results | Judgement |
|-------------------|--|----------------|----------|----------|---------|-----------|
| AC Power Port | 0.15 --- 80 | 20V | M016(M3) | A | A | PASS |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

7.7. Power frequency magnetic field immunity Test

7.7.1. Test Specification

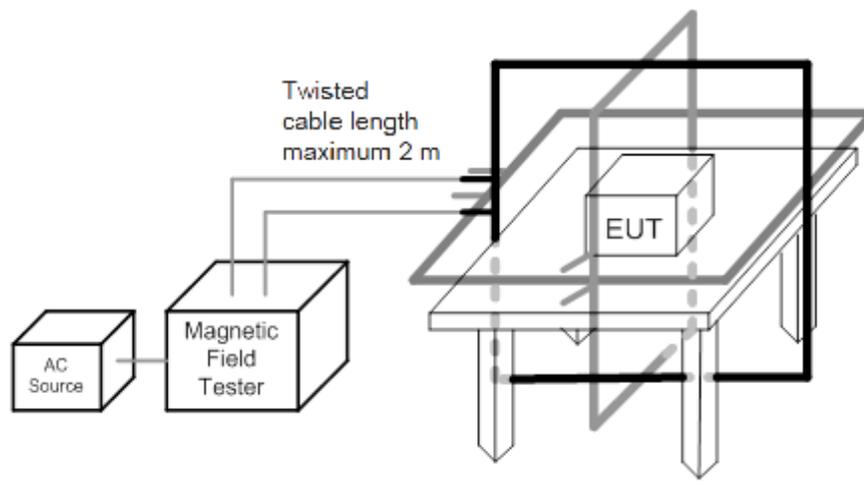
For Standard EN 55024 & EN 55035 :

| | |
|--------------------------|--|
| Standard: | EN 55024/ EN 55035 (refer to IEC/EN 61000-4-8) |
| Frequency Range: | 50 Hz |
| Field Strength: | 1 A/m |
| Observation Time: | 1 minute |
| Inductance Coil: | Rectangular type, 1m x 1m |

7.7.2. Test Procedure

- a. The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
- b. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- c. The cables supplied or recommended by the equipment manufacturer shall be used 1 meter of all cables used shall be exposed to the magnetic field.
- d. The EUT with coil shall be leave all magnetic material and wall 1m away in any axis during the test.
- e. The cable length from generator to coil shall be less than 2m
- f. The background noise shall be 20dB less than test field strength.
- g. Test shall be applied to three axis X, Y, Z and disturbance over 1 minute.
- h. All cables shall be exposed to the magnetic field for 1m of their length.

7.7.3. Test Setup



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50% of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.7.4. Test Results

EN 55024 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 14, 2021 |

| Level | Magnetic Field Strength (A/m) | Criteria | Results | | | Judgement |
|-------|--|----------|---------|---|---|-----------|
| | | | X | Y | Z | |
| 1 | 1 | A | A | A | A | PASS |
| 2 | 3 | / | / | / | / | |
| 3 | 10 | / | / | / | / | |
| 4 | 30 | / | / | / | / | |
| 5 | 100 | / | / | / | / | |
| X | Special | / | / | / | / | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

Customer Request:

| Level | Magnetic Field Strength (A/m) | Criteria | Results | | | Judgement |
|-------|--|----------|---------|---|---|-----------|
| | | | X | Y | Z | |
| 1 | 1 | / | / | / | / | PASS |
| 2 | 3 | / | / | / | / | |
| 3 | 10 | / | / | / | / | |
| 4 | 30 | A | A | A | A | |
| 5 | 100 | / | / | / | / | |
| X | Special | / | / | / | / | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

EN 55035 :

| | | | |
|---------------|--------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 230V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 14, 2021 |

| Level | Magnetic Field Strength (A/m) | Criteria | Results | | | Judgement |
|-------|--|----------|---------|---|---|-----------|
| | | | X | Y | Z | |
| 1 | 1 | A | A | A | A | PASS |
| 2 | 3 | / | / | / | / | |
| 3 | 10 | / | / | / | / | |
| 4 | 30 | / | / | / | / | |
| 5 | 100 | / | / | / | / | |
| X | Special | / | / | / | / | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

Customer Request:

| Level | Magnetic Field Strength (A/m) | Criteria | Results | | | Judgement |
|-------|--|----------|---------|---|---|-----------|
| | | | X | Y | Z | |
| 1 | 1 | / | / | / | / | PASS |
| 2 | 3 | / | / | / | / | |
| 3 | 10 | / | / | / | / | |
| 4 | 30 | A | A | A | A | |
| 5 | 100 | / | / | / | / | |
| X | Special | / | / | / | / | |
| Note | There was no abnormal situation during the test compared with initial operation. | | | | | |

7.8. Voltage Dips and Short Interruptions Immunity Test

7.8.1. Test Specification

For Standard EN 55024 :

| | |
|-------------------------------|---------------------------------------|
| Standard: | EN 55024 (refer to IEC/EN 61000-4-11) |
| Voltage Dips: | >95% reduction ; 30% reduction |
| Voltage Interruptions: | >95% |
| Voltage Phase Angle: | 0°/45°/90°/135°/180°/225°/270°/315° |

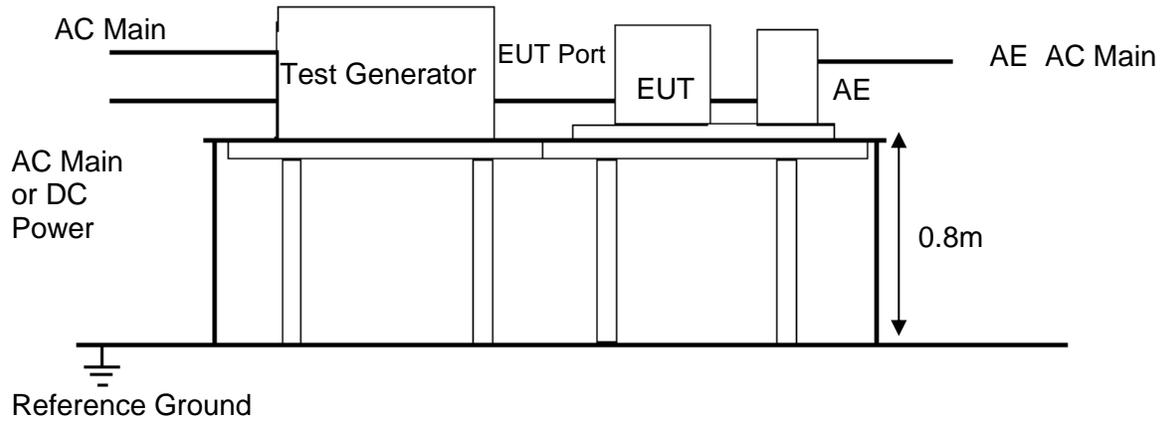
For Standard EN 55035 :

| | |
|-------------------------------|---------------------------------------|
| Standard: | EN 55035 (refer to IEC/EN 61000-4-11) |
| Voltage Dips: | <5% residual ; 70% residual |
| Voltage Interruptions: | <5% |
| Voltage Phase Angle: | 0°/45°/90°/135°/180°/225°/270°/315° |

7.8.2. Test Procedure

- a. The power cord was used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.
- b. For voltage dips, changes in supply voltage shall occur at zero crossings of the voltage, and at additional angles considered critical by product committees or individual product specifications preferably selected from 45°, 90°, 135°, 180°, 225°, 270° and 315° on each phase.
- c. For short interruptions, the angle shall be defined by the product committee as the worst case. In the absence of definition, it is recommended to use 0° for one of the phases.

7.8.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.8.4. Test Result

EN 55024 :

| | | | |
|---------------|----------------------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 100V/50Hz, 240V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| 100V/50Hz | | | | | |
|-----------------------|--|-------------------|----------|---------|----------|
| Interruption & Dips | Duration (cycle) | Reduction voltage | Criteria | Results | Judgment |
| Voltage dips | 0.5 | >95% | B | A | PASS |
| | 25 | 30% | C | A | |
| Voltage interruptions | 250 | >95% | C | B | |
| Note | Results A: The equipment continue to operate as intended without operator intervention. Results B: The output voltage was lost during the test, but it will automatically return to normal conditions after the test. | | | | |

| 240V/50Hz | | | | | |
|-----------------------|--|-------------------|----------|---------|----------|
| Interruption & Dips | Duration (cycle) | Reduction voltage | Criteria | Results | Judgment |
| Voltage dips | 0.5 | >95% | B | A | PASS |
| | 25 | 30% | C | A | |
| Voltage interruptions | 250 | >95% | C | B | |
| Note | Results A: The equipment continue to operate as intended without operator intervention. Results B: The output voltage was lost during the test, but it will automatically return to normal conditions after the test. | | | | |

EN 55035 :

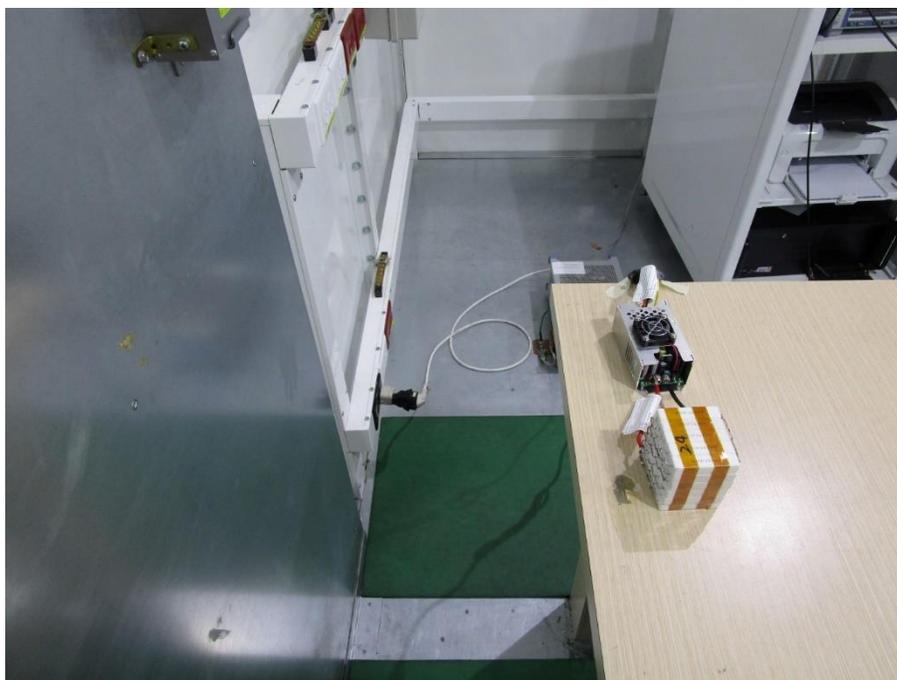
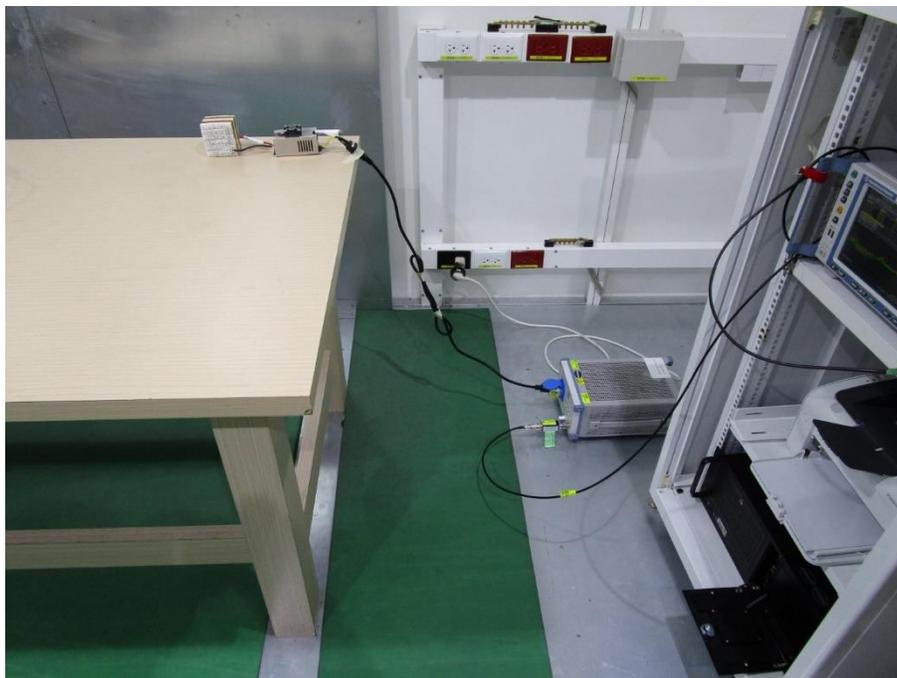
| | | | |
|---------------|----------------------------|--------------|---------------|
| Test Mode: | Mode 2 | Temperature: | 22°C |
| Test Voltage: | AC 100V/50Hz, 240V/50Hz | Humidity: | 65%RH |
| Tested By: | Eric T. Fan | Test Date: | Apr. 12, 2021 |

| 100V/50Hz | | | | | |
|-----------------------|--|------------------|------------------|---------|----------|
| Interruption & Dips | Duration (cycle) | Residual voltage | Perform Criteria | Results | Judgment |
| Voltage dips | 0.5 | <5% | B | A | PASS |
| | 25 | 70% | C | A | |
| Voltage interruptions | 250 | <5% | C | B | |
| Note | Results A: The equipment continue to operate as intended without operator intervention. Results B: The output voltage was lost during the test, but it will automatically return to normal conditions after the test. | | | | |

| 240V/50Hz | | | | | |
|-----------------------|--|------------------|------------------|---------|----------|
| Interruption & Dips | Duration (cycle) | Residual voltage | Perform Criteria | Results | Judgment |
| Voltage dips | 0.5 | <5% | B | A | PASS |
| | 25 | 70% | C | A | |
| Voltage interruptions | 250 | <5% | C | B | |
| Note | Results A: The equipment continue to operate as intended without operator intervention. Results B: The output voltage was lost during the test, but it will automatically return to normal conditions after the test. | | | | |

Appendix I: Photographs of EMC Test Configuration

Conducted Disturbance



Radiated Disturbance
Below 1GHz

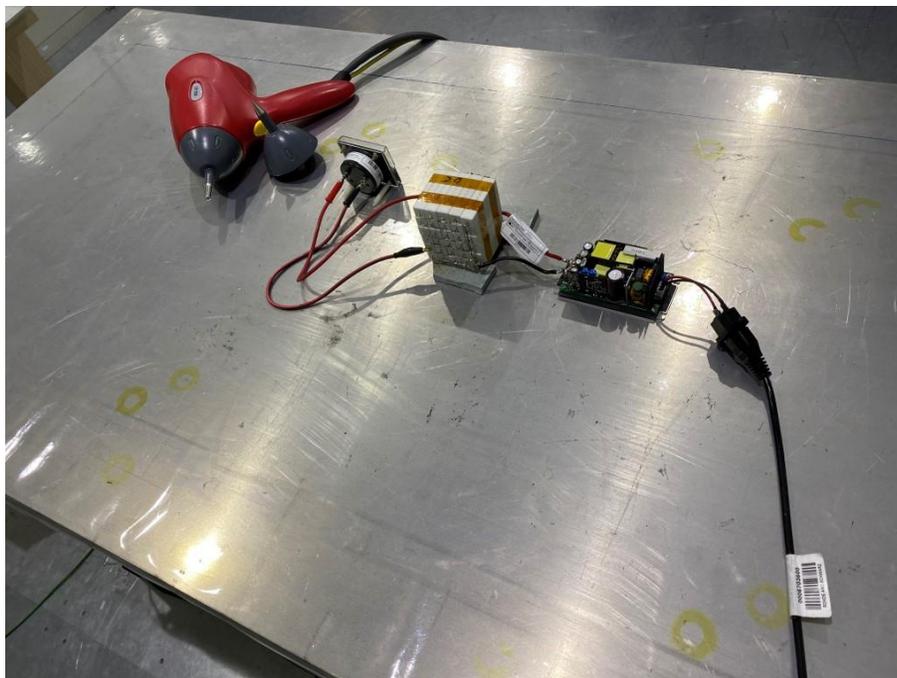
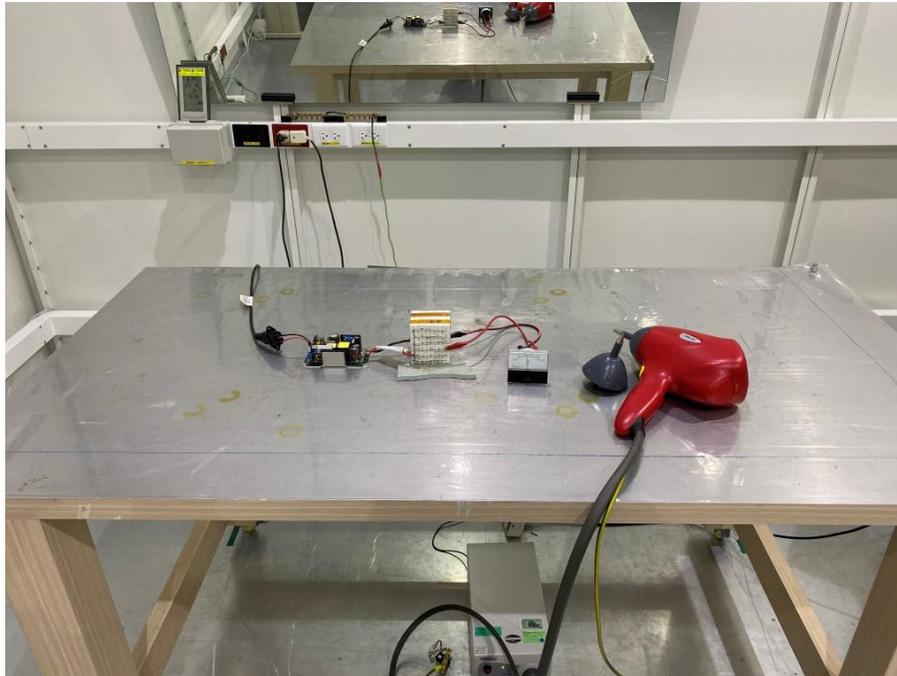


Harmonic and Flicker

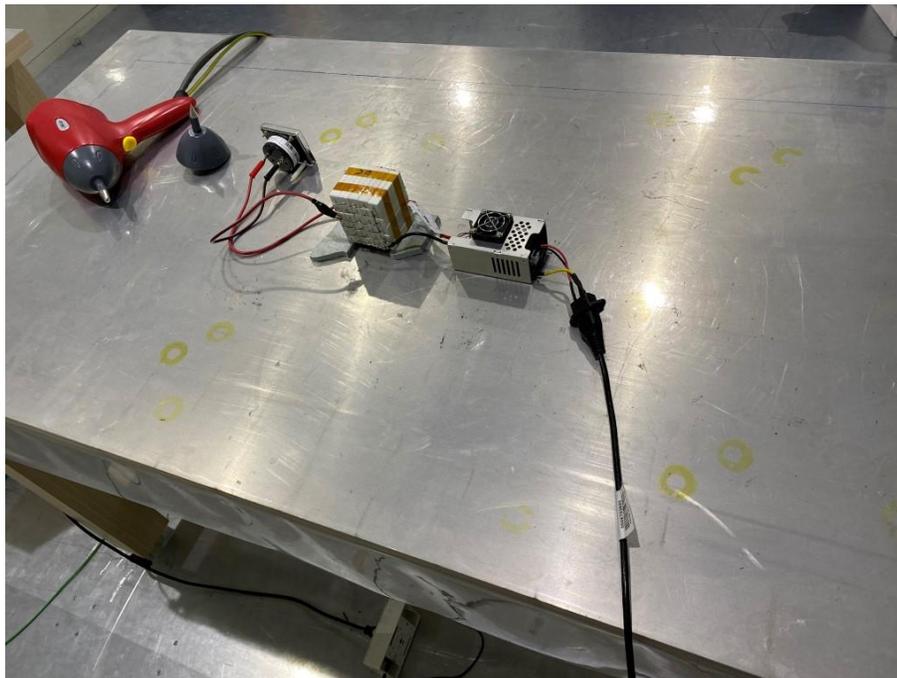
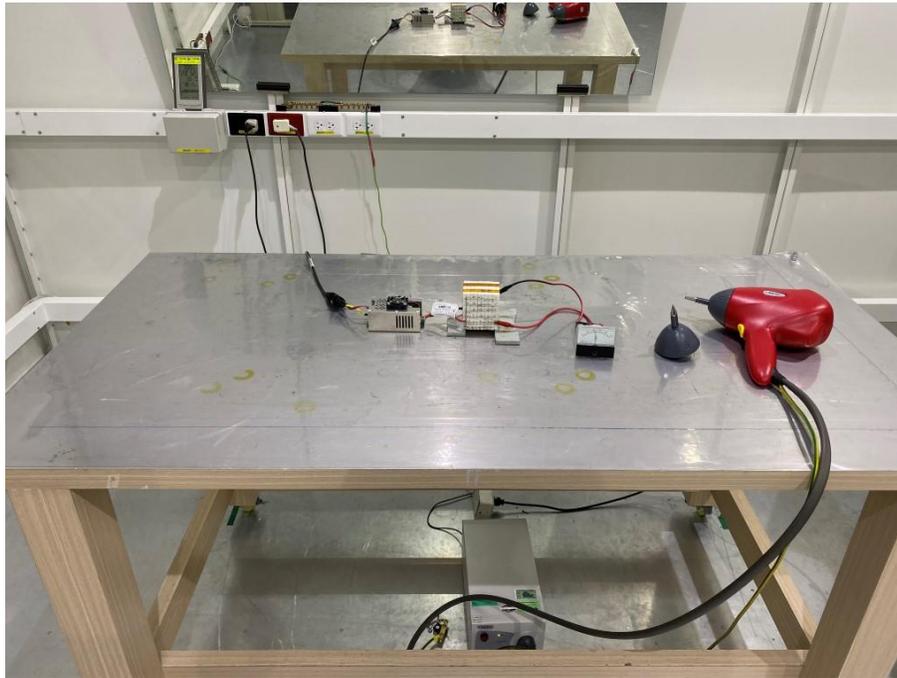


Electrostatic Discharge Immunity

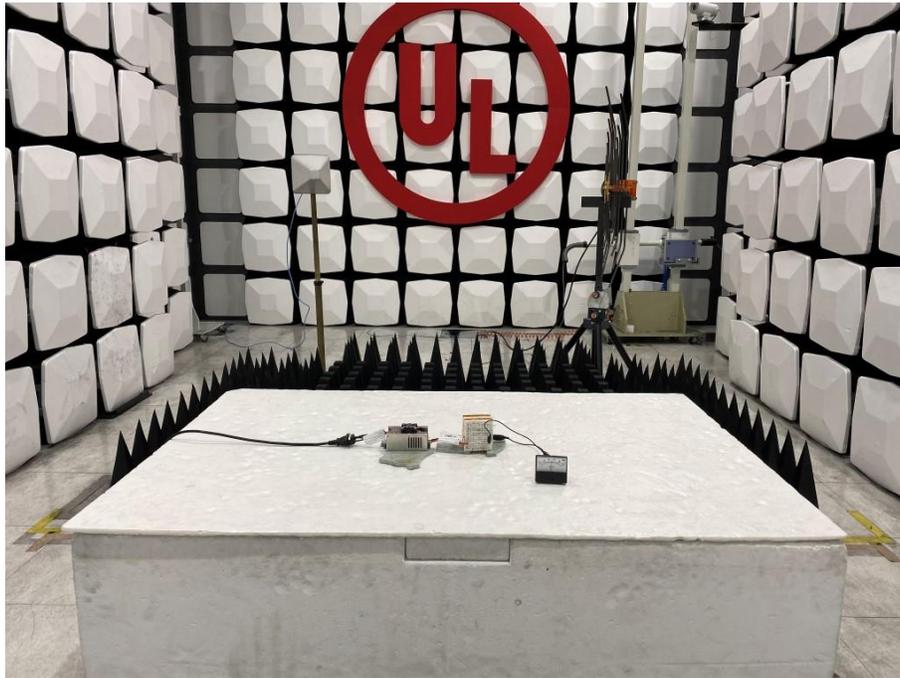
Mode 1



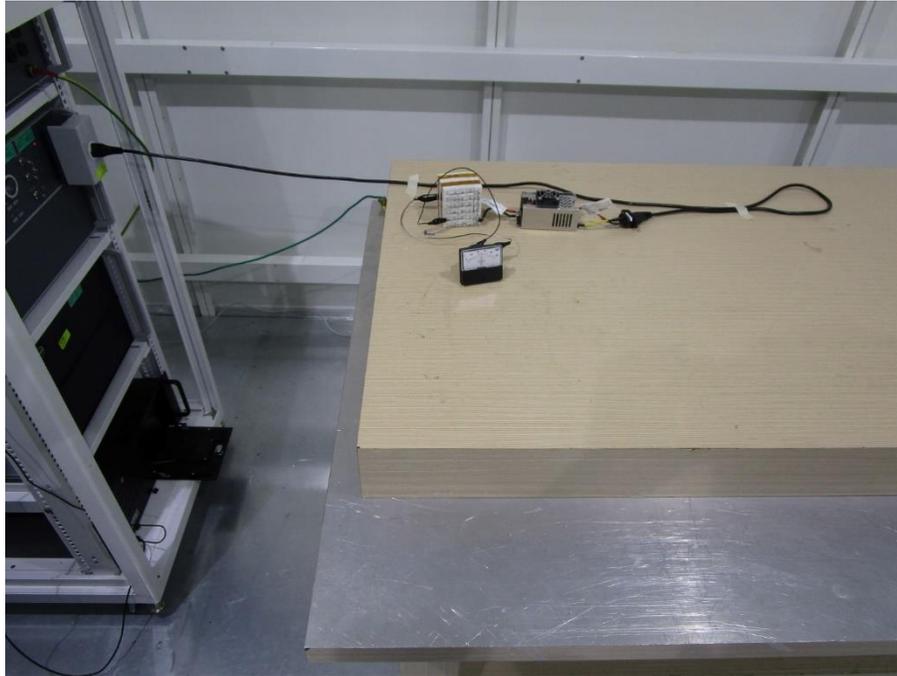
Mode 2



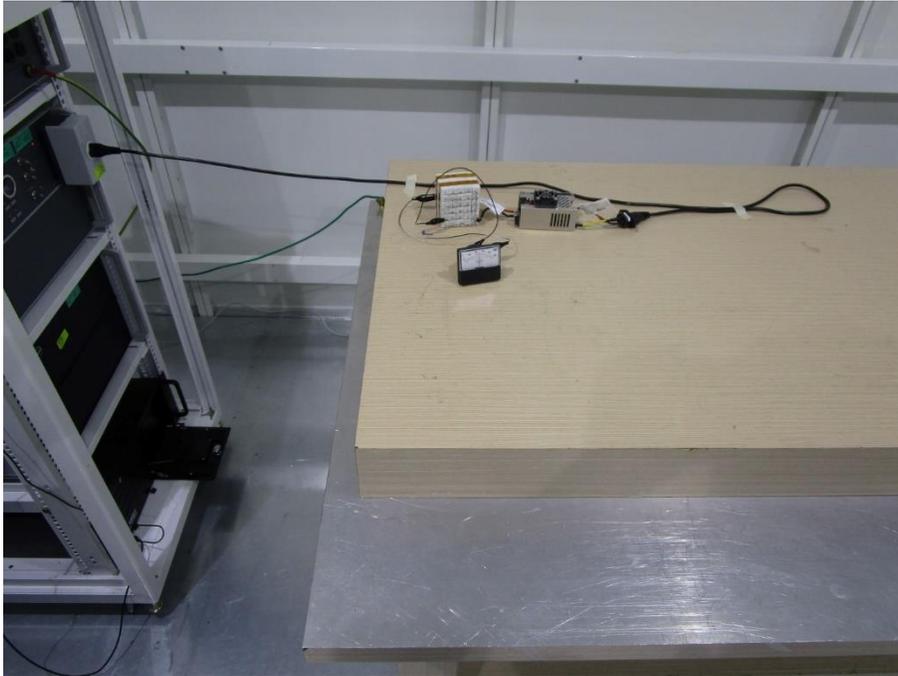
Radio Frequency Electromagnetic Field Immunity



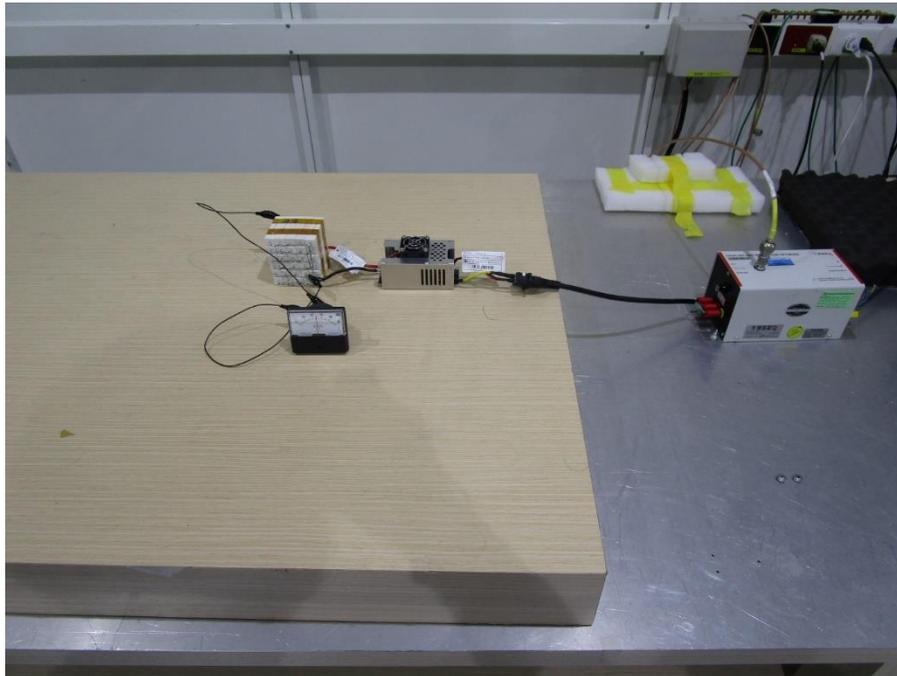
Electrical Fast Transient Immunity



Surge Immunity



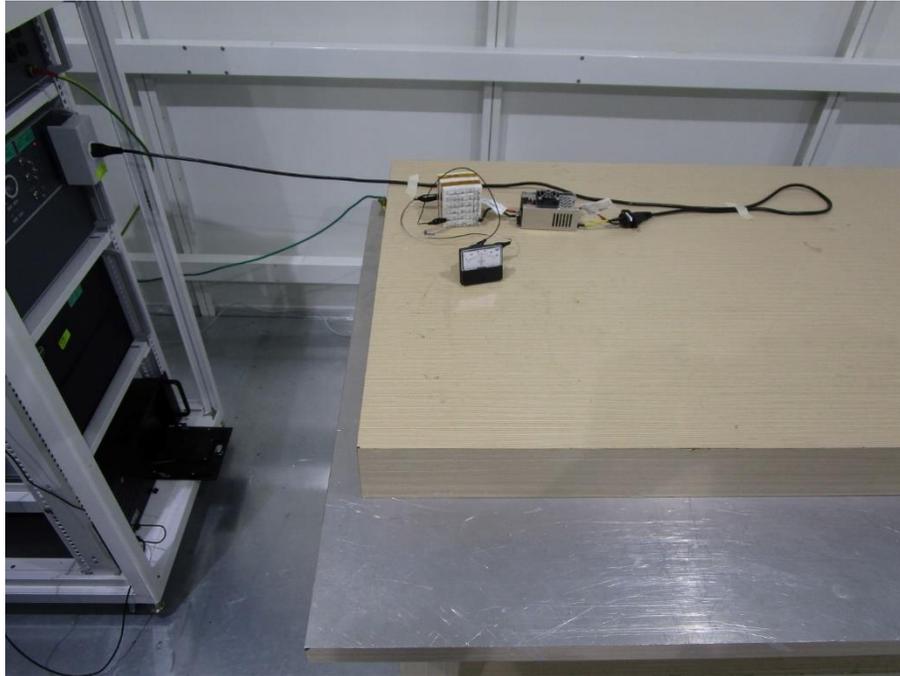
Immunity to conducted disturbances induced by RF fields



Power frequency magnetic field immunity



Voltage Dips and Short Interruptions Immunity



Appendix II: Photographs of the EUT

Please see the photographs of EUT in the test report no.: 4790133959-EP.

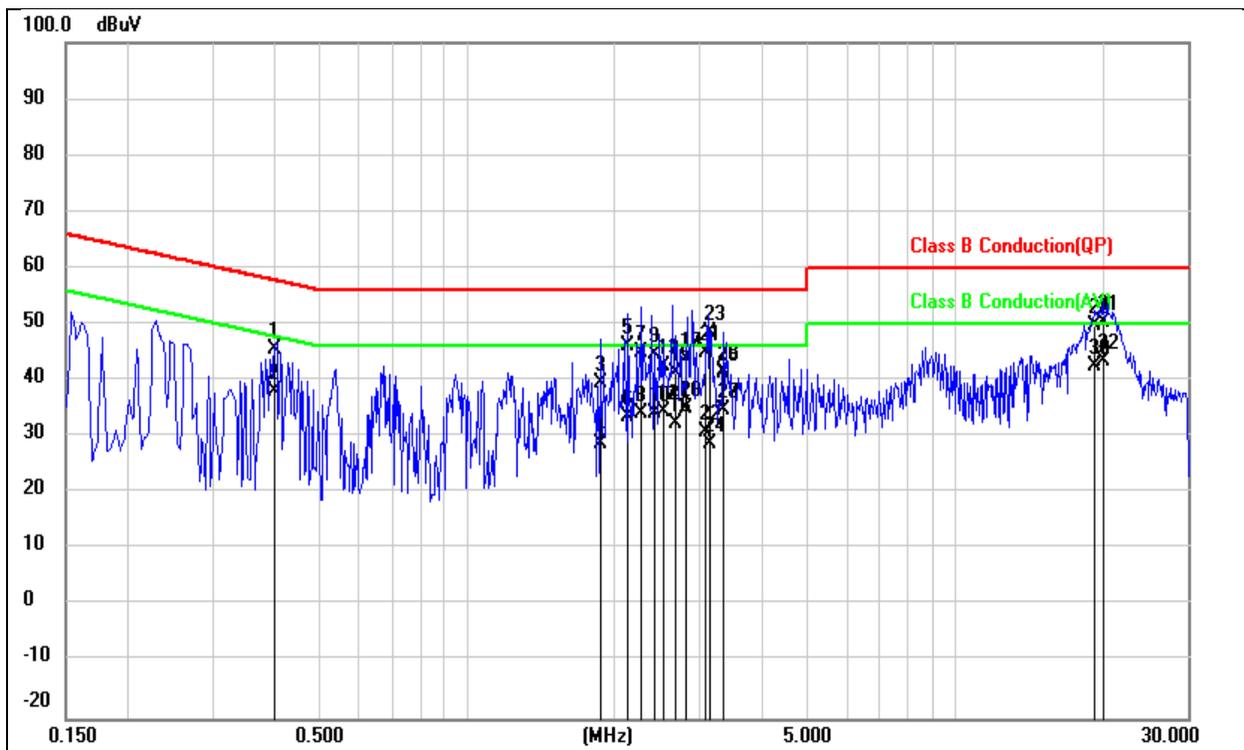
END OF REPORT

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Appendix III: Preliminary Test Raw Data

Conducted Emission :

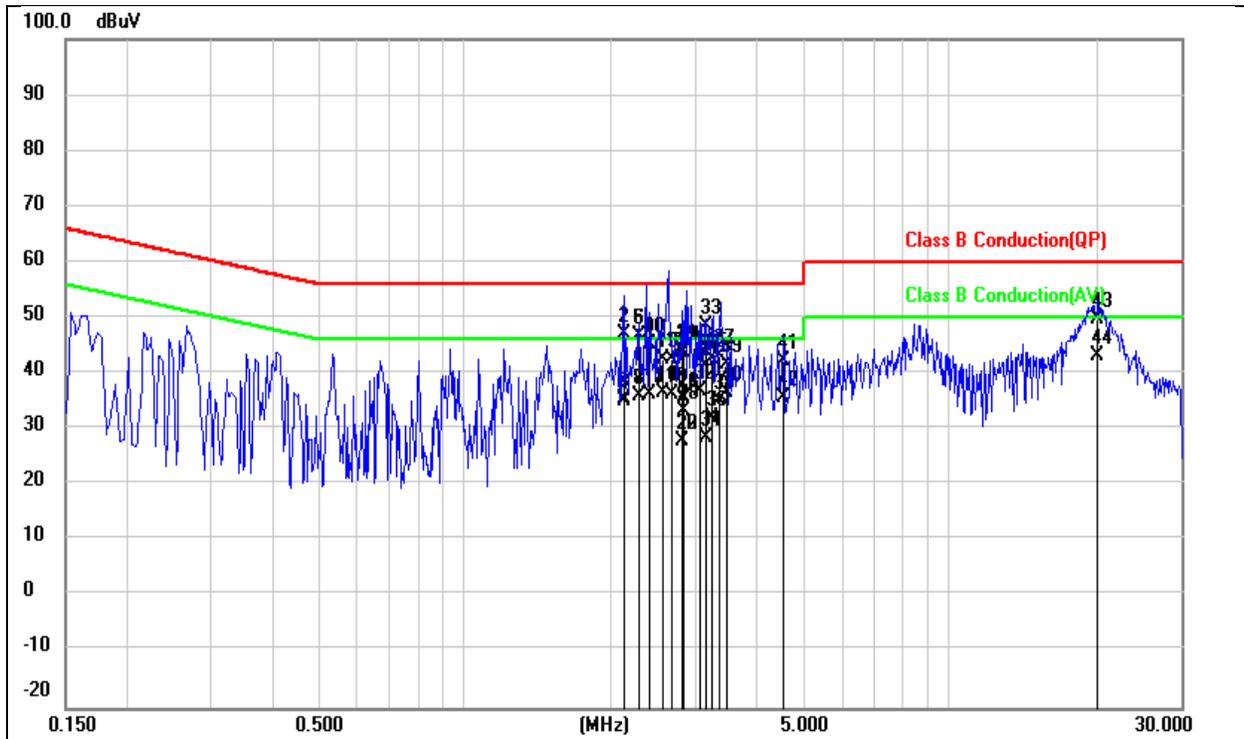
| | | | |
|------------------|------------------------|---------------|-------------|
| Project No.: | 4790133959 | Probe: | L1 |
| Standard: | Class B Conduction(QP) | Power Source: | AC230V_50Hz |
| Test item: | Conduction Test | Date: | 3/17/2021 |
| Temp./Hum.(%RH): | 23(C)/53%RH | Time: | 5:34:08 PM |
| EUT: | AC to DC Power Supply | Test By: | Eric T Fan |
| Model: | 27. TPP 300-124L-M | | |
| Mode: | mode 1 | | |
| Note: | | | |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------|---------------|--------------|-------------|--------|
| 1 | 0.4015 | 26.05 | 19.48 | 45.53 | 57.82 | -12.29 | QP |
| 2 | 0.4015 | 18.53 | 19.48 | 38.01 | 47.82 | -9.81 | AVG |
| 3 | 1.8712 | 20.05 | 19.53 | 39.58 | 56.00 | -16.42 | QP |
| 4 | 1.8712 | 9.26 | 19.53 | 28.79 | 46.00 | -17.21 | AVG |
| 5 | 2.1435 | 26.74 | 19.53 | 46.27 | 56.00 | -9.73 | QP |
| 6 | 2.1435 | 13.92 | 19.53 | 33.45 | 46.00 | -12.55 | AVG |
| 7 | 2.2773 | 25.47 | 19.54 | 45.01 | 56.00 | -10.99 | QP |
| 8 | 2.2773 | 14.52 | 19.54 | 34.06 | 46.00 | -11.94 | AVG |
| 9 | 2.4107 | 25.15 | 19.54 | 44.69 | 56.00 | -11.31 | QP |
| 10 | 2.4107 | 14.63 | 19.54 | 34.17 | 46.00 | -11.83 | AVG |
| 11 | 2.5445 | 22.99 | 19.54 | 42.53 | 56.00 | -13.47 | QP |
| 12 | 2.5445 | 15.04 | 19.54 | 34.58 | 46.00 | -11.42 | AVG |
| 13 | 2.5446 | 22.96 | 19.54 | 42.50 | 56.00 | -13.50 | QP |
| 14 | 2.5446 | 15.00 | 19.54 | 34.54 | 46.00 | -11.46 | AVG |

| | | | | | | | |
|----|---------|-------|-------|-------|-------|--------|-----|
| 15 | 2.6741 | 21.77 | 19.54 | 41.31 | 56.00 | -14.69 | QP |
| 16 | 2.6741 | 12.83 | 19.54 | 32.37 | 46.00 | -13.63 | AVG |
| 17 | 2.8115 | 24.17 | 19.54 | 43.71 | 56.00 | -12.29 | QP |
| 18 | 2.8115 | 15.46 | 19.54 | 35.00 | 46.00 | -11.00 | AVG |
| 19 | 2.8117 | 24.23 | 19.54 | 43.77 | 56.00 | -12.23 | QP |
| 20 | 2.8117 | 15.43 | 19.54 | 34.97 | 46.00 | -11.03 | AVG |
| 21 | 3.0859 | 25.37 | 19.56 | 44.93 | 56.00 | -11.07 | QP |
| 22 | 3.0859 | 11.29 | 19.56 | 30.85 | 46.00 | -15.15 | AVG |
| 23 | 3.1380 | 28.95 | 19.56 | 48.51 | 56.00 | -7.49 | QP |
| 24 | 3.1380 | 9.20 | 19.56 | 28.76 | 46.00 | -17.24 | AVG |
| 25 | 3.3463 | 22.01 | 19.56 | 41.57 | 56.00 | -14.43 | QP |
| 26 | 3.3463 | 21.94 | 19.56 | 41.50 | 56.00 | -14.50 | QP |
| 27 | 3.3463 | 15.30 | 19.56 | 34.86 | 46.00 | -11.14 | AVG |
| 28 | 3.3463 | 15.31 | 19.56 | 34.87 | 46.00 | -11.13 | AVG |
| 29 | 19.3946 | 29.89 | 19.76 | 49.65 | 60.00 | -10.35 | QP |
| 30 | 19.3946 | 22.77 | 19.76 | 42.53 | 50.00 | -7.47 | AVG |
| 31 | 20.0636 | 30.49 | 19.76 | 50.25 | 60.00 | -9.75 | QP |
| 32 | 20.0636 | 23.58 | 19.76 | 43.34 | 50.00 | -6.66 | AVG |

| | | | |
|------------------|------------------------|---------------|-------------|
| Project No.: | 4790133959 | Probe: | N |
| Standard: | Class B Conduction(QP) | Power Source: | AC230V_50Hz |
| Test item: | Conduction Test | Date: | 3/17/2021 |
| Temp./Hum.(%RH): | 23(C)/53%RH | Time: | 5:40:57 PM |
| EUT: | AC to DC Power Supply | Test By: | Eric T Fan |
| Model: | 28. TPP 300-124L-M | | |
| Mode: | mode 1 | | |
| Note: | | | |

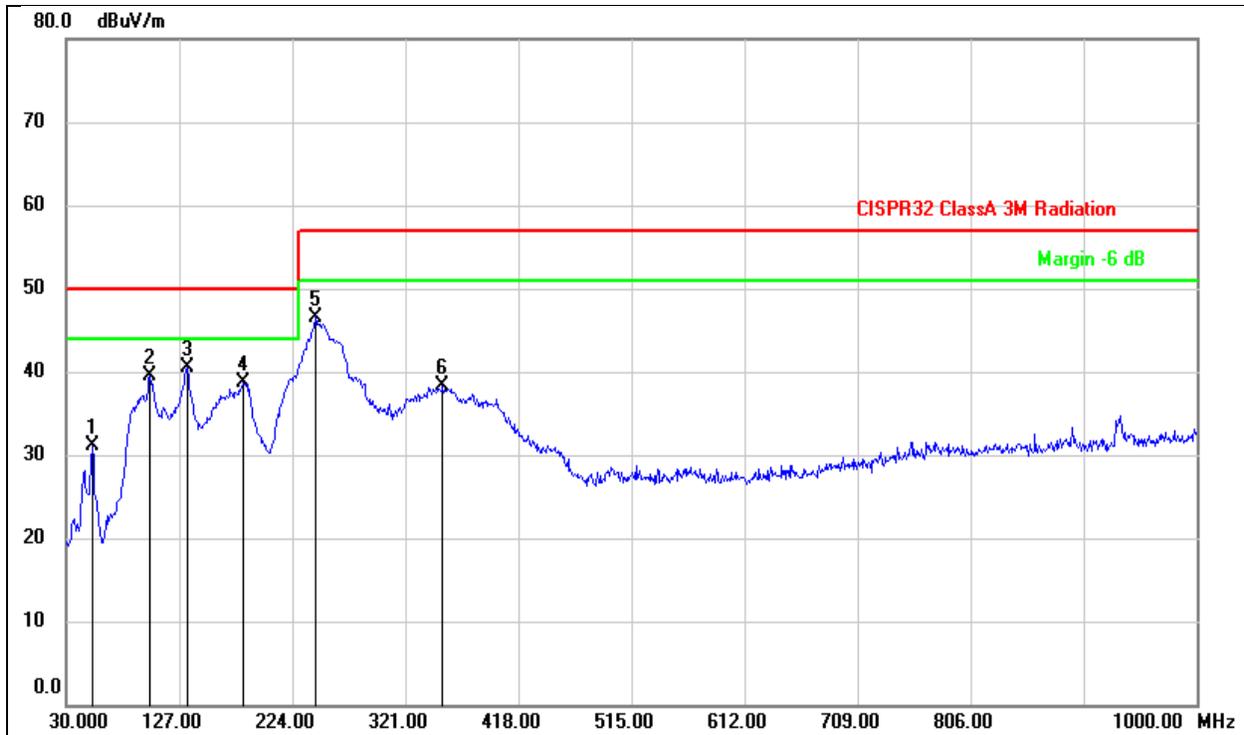


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------|---------------|--------------|-------------|--------|
| 1 | 2.1414 | 27.42 | 19.52 | 46.94 | 56.00 | -9.06 | QP |
| 2 | 2.1414 | 27.50 | 19.52 | 47.02 | 56.00 | -8.98 | QP |
| 3 | 2.1414 | 15.69 | 19.52 | 35.21 | 46.00 | -10.79 | AVG |
| 4 | 2.1414 | 15.67 | 19.52 | 35.19 | 46.00 | -10.81 | AVG |
| 5 | 2.2753 | 27.29 | 19.53 | 46.82 | 56.00 | -9.18 | QP |
| 6 | 2.2753 | 27.20 | 19.53 | 46.73 | 56.00 | -9.27 | QP |
| 7 | 2.2753 | 16.37 | 19.53 | 35.90 | 46.00 | -10.10 | AVG |
| 8 | 2.2753 | 16.32 | 19.53 | 35.85 | 46.00 | -10.15 | AVG |
| 9 | 2.4089 | 25.71 | 19.53 | 45.24 | 56.00 | -10.76 | QP |
| 10 | 2.4089 | 25.64 | 19.53 | 45.17 | 56.00 | -10.83 | QP |
| 11 | 2.4089 | 16.75 | 19.53 | 36.28 | 46.00 | -9.72 | AVG |
| 12 | 2.4089 | 16.79 | 19.53 | 36.32 | 46.00 | -9.68 | AVG |
| 13 | 2.5422 | 22.97 | 19.54 | 42.51 | 56.00 | -13.49 | QP |
| 14 | 2.5422 | 17.04 | 19.54 | 36.58 | 46.00 | -9.42 | AVG |
| 15 | 2.5424 | 22.91 | 19.54 | 42.45 | 56.00 | -13.55 | QP |
| 16 | 2.5424 | 17.03 | 19.54 | 36.57 | 46.00 | -9.43 | AVG |
| 17 | 2.6753 | 23.04 | 19.54 | 42.58 | 56.00 | -13.42 | QP |
| 18 | 2.6753 | 16.69 | 19.54 | 36.23 | 46.00 | -9.77 | AVG |
| 19 | 2.7941 | 24.16 | 19.54 | 43.70 | 56.00 | -12.30 | QP |

| | | | | | | | |
|----|---------|-------|-------|-------|-------|--------|-----|
| 20 | 2.7941 | 8.21 | 19.54 | 27.75 | 46.00 | -18.25 | AVG |
| 21 | 2.7955 | 24.47 | 19.54 | 44.01 | 56.00 | -11.99 | QP |
| 22 | 2.7955 | 8.41 | 19.54 | 27.95 | 46.00 | -18.05 | AVG |
| 23 | 2.8121 | 24.30 | 19.54 | 43.84 | 56.00 | -12.16 | QP |
| 24 | 2.8121 | 16.09 | 19.54 | 35.63 | 46.00 | -10.37 | AVG |
| 25 | 2.8122 | 24.24 | 19.54 | 43.78 | 56.00 | -12.22 | QP |
| 26 | 2.8122 | 15.95 | 19.54 | 35.49 | 46.00 | -10.51 | AVG |
| 27 | 2.8143 | 24.13 | 19.54 | 43.67 | 56.00 | -12.33 | QP |
| 28 | 2.8143 | 13.85 | 19.54 | 33.39 | 46.00 | -12.61 | AVG |
| 29 | 3.0765 | 22.80 | 19.55 | 42.35 | 56.00 | -13.65 | QP |
| 30 | 3.0765 | 17.23 | 19.55 | 36.78 | 46.00 | -9.22 | AVG |
| 31 | 3.0765 | 22.88 | 19.55 | 42.43 | 56.00 | -13.57 | QP |
| 32 | 3.0765 | 17.22 | 19.55 | 36.77 | 46.00 | -9.23 | AVG |
| 33 | 3.1446 | 29.03 | 19.55 | 48.58 | 56.00 | -7.42 | QP |
| 34 | 3.1446 | 8.94 | 19.55 | 28.49 | 46.00 | -17.51 | AVG |
| 35 | 3.2157 | 23.00 | 19.55 | 42.55 | 56.00 | -13.45 | QP |
| 36 | 3.2157 | 12.49 | 19.55 | 32.04 | 46.00 | -13.96 | AVG |
| 37 | 3.3473 | 23.71 | 19.55 | 43.26 | 56.00 | -12.74 | QP |
| 38 | 3.3473 | 15.47 | 19.55 | 35.02 | 46.00 | -10.98 | AVG |
| 39 | 3.4771 | 22.11 | 19.55 | 41.66 | 56.00 | -14.34 | QP |
| 40 | 3.4771 | 16.93 | 19.55 | 36.48 | 46.00 | -9.52 | AVG |
| 41 | 4.5466 | 22.68 | 19.58 | 42.26 | 56.00 | -13.74 | QP |
| 42 | 4.5466 | 16.19 | 19.58 | 35.77 | 46.00 | -10.23 | AVG |
| 43 | 20.1861 | 30.00 | 19.83 | 49.83 | 60.00 | -10.17 | QP |
| 44 | 20.1861 | 23.41 | 19.83 | 43.24 | 50.00 | -6.76 | AVG |

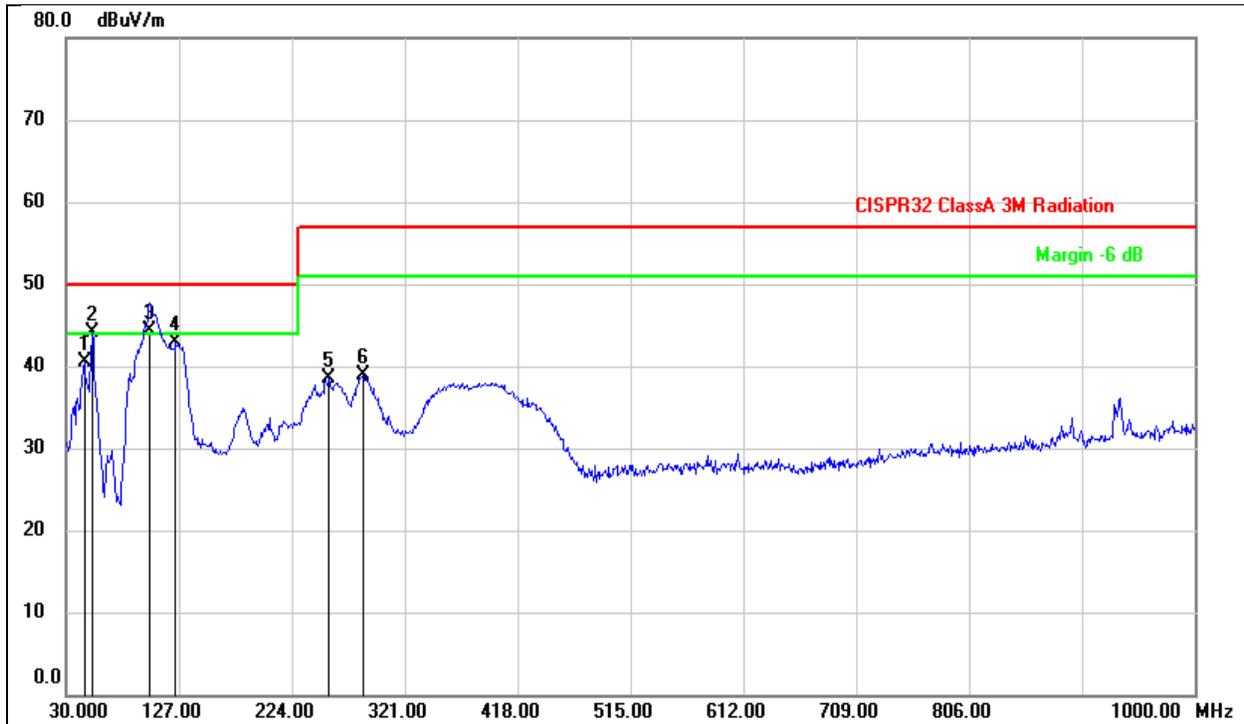
Radiated Emission :

| | | | |
|------------------|-----------------------------|---------------|--------------|
| Project No.: | 4790133959 | Polarization: | Horizontal |
| Standard: | CISPR32 ClassA 3M Radiation | Power Source: | AC 230V/50Hz |
| Test item: | Radiation Test | Date: | 2/25/2021 |
| Temp./Hum.(%RH): | 25(C)/59%RH | Time: | 8:11:54 PM |
| EUT: | AC to DC Power Supply | Test By: | Rupert Hunag |
| Model: | TPP 300-124L-M | Distance: | 3m |
| Mode: | Mode 1 | | |
| Note: | | | |



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|------------------|--------------|-----------------|----------------|-------------|--------|
| 1 | 52.9890 | 43.33 | -12.30 | 31.03 | 50.00 | -18.97 | peak |
| 2 | 102.0387 | 56.11 | -16.54 | 39.57 | 50.00 | -10.43 | peak |
| 3 | 134.2103 | 53.45 | -12.99 | 40.46 | 50.00 | -9.54 | peak |
| 4 | 182.7427 | 52.42 | -13.71 | 38.71 | 50.00 | -11.29 | peak |
| 5 | 244.8227 | 59.85 | -13.25 | 46.60 | 57.00 | -10.40 | peak |
| 6 | 353.4627 | 48.04 | -9.67 | 38.37 | 57.00 | -18.63 | peak |

| | | | |
|------------------|-----------------------------|---------------|--------------|
| Project No.: | 4790133959 | Polarization: | Vertical |
| Standard: | CISPR32 ClassA 3M Radiation | Power Source: | AC 230V/50Hz |
| Test item: | Radiation Test | Date: | 2/25/2021 |
| Temp./Hum.(%RH): | 25(C)/59%RH | Time: | 8:16:10 PM |
| EUT: | AC to DC Power Supply | Test By: | Rupert Hunag |
| Model: | TPP 300-124L-M | Distance: | 3m |
| Mode: | Mode 1 | | |
| Note: | | | |



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|------------------|--------------|-----------------|----------------|-------------|--------|
| 1 | 45.6493 | 52.62 | -12.11 | 40.51 | 50.00 | -9.49 | peak |
| 2 | 53.1183 | 56.49 | -12.34 | 44.15 | 50.00 | -5.85 | peak |
| 3 | 102.2973 | 60.94 | -16.54 | 44.40 | 50.00 | -5.60 | QP |
| 4 | 124.9630 | 56.69 | -13.88 | 42.81 | 50.00 | -7.19 | peak |
| 5 | 256.7537 | 51.47 | -12.87 | 38.60 | 57.00 | -18.40 | peak |
| 6 | 285.7567 | 50.22 | -11.38 | 38.84 | 57.00 | -18.16 | peak |